DEAF GAIN

RAISING THE STAKES FOR HUMAN DIVERSITY

H-DIRKSEN L. BAUMAN and
JOSEPH J. MURRAY
Editors

Foreword by ANDREW SOLOMON
Afterword by TOVE SKUTNABB-KANGAS

DEAF **GAIN**

ALSO PUBLISHED BY THE
UNIVERSITY OF MINNESOTA PRESS

Open Your Eyes: Deaf Studies Talking
H-Dirksen L. Bauman, Editor

Worlds of Autism: Across the Spectrum of Neurological Difference
Joyce Davidson and Michael Orsini, Editors

DEAF**GAIN**

RAISING THE STAKES FOR HUMAN DIVERSITY

H-Dirksen L. Bauman and
Joseph J. Murray, Editors

Foreword by Andrew Solomon

Afterword by Tove Skuttnab-Kangas

UNIVERSITY OF MINNESOTA PRESS
Minneapolis • London

Portions of chapter 5 were previously published in David Armstrong, *Show of Hands: A Natural History of Sign Language* (Washington, D.C.: Gallaudet University Press, 2011), and as "The Gestural Theory of Language Origins," *Sign Language Studies* 8, no. 3 (2008): 289–314. An earlier version of chapter 11 was published as Jennifer Nelson, "Bulwer's Speaking Hands: Deafness and Rhetoric," in Sharon L. Snyder, Brenda Jo Brueggemann, and Rosemarie Garland-Thomson, eds., *Disability Studies: Enabling the Humanities* (New York: Modern Language Association of America, 2002), 221; reprinted by permission of the Modern Language Association. An earlier version of chapter 24 was published in Christopher Krentz, *Writing Deafness: The Hearing Line in Nineteenth-Century American Literature* (Chapel Hill: University of North Carolina Press, 2007).

Supplemental materials for this book can be found on the University of Minnesota Press website, www.upress.umn.edu.

Copyright 2014 by the Regents of the University of Minnesota

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher.

Published by the University of Minnesota Press
111 Third Avenue South, Suite 290
Minneapolis, MN 55401–2520
http://www.upress.umn.edu

LIBRARY OF CONGRESS CATALOGING-IN-PUBLICATION DATA
Deaf gain : raising the stakes for human diversity / H-Dirksen L. Bauman and Joseph J. Murray, editors ; foreword by Andrew Solomon.
Includes bibliographical references and index.
ISBN 978-1-4529-4204-9
1. Deaf. 2. Deaf culture. I. Bauman, H-Dirksen L., 1964– II. Murray, Joseph J.
HV2380.D425 2014 305.9´082—dc23
2014017091

The University of Minnesota is an equal-opportunity educator and employer.

CONTENTS

Foreword: Deaf Loss *ix*
Andrew Solomon

Editors' Note on Terminology *xiii*

Deaf Gain: An Introduction *xv*
H-Dirksen L. Bauman and Joseph J. Murray

I. PHILOSOPHICAL GAINS

1. Armchairs and Stares: On the Privation of Deafness *3*
Teresa Blankmeyer Burke

2. Identifying the "Able" in a Vari-able World: Two Lessons *23*
James Tabery

3. The Case for Deaf Legal Theory through the Lens of Deaf Gain *37*
Alison Bryan and Steve Emery

II. LANGUAGE GAINS

4. Three Revolutions: Language, Culture, and Biology *65*
Laura-Ann Petitto

5. Deaf Gain in Evolutionary Perspective *77*
David Armstrong

6. Deaf Gains in the Study of Bilingualism and Bilingual Education *95*
Ofelia García and Debra Cole

7. What We Learned from Sign Languages When We Stopped Having to Defend Them *112*
Cindee Calton

III. LANGUAGE GAINS IN ACTION

8. Advantages of Learning a Signed Language *133*
Peter C. Hauser and Geo Kartheiser

9. Baby Sign as Deaf Gain *146*
Kristin Snoddon

10. Manual Signs and Gestures of the Inuit of Baffin Island: Observations during the Three Voyages Led by Martin Frobisher *159*
Clara Sherley-Appel and John D. Bonvillian

11. Bulwer's Speaking Hands: Deafness and Rhetoric *182*
Jennifer Nelson

IV. SENSORY GAINS

12. Seeing the World through Deaf Eyes *193*
Matthew Dye

13. A Magic Touch: Deaf Gain and the Benefits of Tactile Sensation *211*
Donna Jo Napoli

14. Senses and Culture: Exploring Sensory Orientations *233*
Benjamin Bahan

15. The Deaf Gain of Wladislav Zeitlin, Jewish Scientist and Inventor *255*
Mark Zaurov

16. The Hidden Gain: A New Lens of Research with d/Deaf Children and Adults *269*
Hilary Sutherland and Katherine D. Rogers

V. SOCIAL GAINS

17. Deaf Gain and Shared Signing Communities *285*
Annelies Kusters

18. Gainful Employment: Historical Examples from Akron, Ohio *306*
Kati Morton

19. Effective Deaf Action in the Deaf Community in Uruguay *321*
Elizabeth M. Lockwood

20. Deaf Gains in Brazil: Linguistic Policies and Network Establishment *341*
Ronice Müller de Quadros, Karin Strobel, and Mara Lúcia Masutti

21. Deaf Gain: Beyond Deaf Culture *356*
Irene W. Leigh, Donna A. Morere, and Caroline Kobek Pezzarossi

VI. CREATIVE GAINS

22. DeafSpace: An Architecture toward a More Livable and Sustainable World *375*
Hansel Bauman

23. Co-design from Divergent Thinking *402*
Antti Raike, Suvi Pylvänen, and Päivi Rainò

24. The Hearing Line: How Literature Gains from Deaf People *421*
Christopher Krentz

25. Deaf Music: Embodying Language and Rhythm *436*
Summer Loeffler

26. Deaf Gain and Creativity in Signed Literature *457*
Rachel Sutton-Spence

27. Deaf Gain and the Creative Arts: Interviews with Deaf Artists *478*
Jennifer Grinder Witteborg

Afterword. Implications of Deaf Gain: Linguistic Human Rights for Deaf Citizens *492*
Tove Skutnabb-Kangas

Acknowledgments *503*

Contributors *504*

Index *513*

FOREWORD
Deaf Loss

ANDREW SOLOMON

When I was asked to research Deaf culture for the *New York Times* in 1994, I had no idea that there was such a thing. My first forays to deaf clubs, theaters, and households astonished me. I was soon convinced that there was indeed a Deaf culture, organized around the shared use of American Sign Language (ASL). I came to appreciate that culture's nuances, to understand that not all deaf people were Deaf but that many nonetheless had a social life and sense of community with other deaf people. I learned a few signs and considered how different they were from speech. I made my first Deaf friends. I documented the protests unfolding at the Lexington Center for the Deaf over the appointment of a hearing CEO. I stayed in a dormitory at Gallaudet University for a few days and saw how passionately people were communicating, what ideas they were awakening in one another.

Then I went to the National Association of the Deaf (NAD) meeting, which was in Nashville that year, and experienced more fully how seductive Deaf culture could be. An excellent translator accompanied me full-time, but even so I missed much of what was being said, especially at social gatherings. She could not translate the conversations I saw in the distance; she could not shift her attention at the same moment I did; discussions with multiple signers were hard to parse; and, in any case, translation always dilutes and alters what is being said. Seeing people greet one another with animated faces, seeing the electric quality of the dialogue all around me, I found myself wishing I were Deaf. It would have been helpful merely to know ASL, but I understood that true membership in this society had a great deal to do with the actual shared experience of deafness. I saw very clearly the things Deaf people had that I didn't have, and I regretted my deficits.

Since the publication of my book *Far from the Tree: Parents, Children, and the Search for Identity,* I have found myself recounting this story often. Hearing audiences often wonder how anyone could wish away his hearing. I have had to explain time and again that I wasn't wishing away my hearing. I make use of my ears constantly and get great pleasure from euphonious sounds. But I was wishing into existence an unrealized aspect of my humanity: my Deafness. I wasn't keen to lose what I had but rather to gain what others had and I did not. I said, in effect, that I had Deaf loss as much as deaf people have hearing loss.

American movements toward liberation have proceeded in single file: religious tolerance was a founding principle of this country (though one that still seems to elude many citizens); women's suffrage came next; then began the civil rights movement aimed at racial equality. These movements all related to vertical identities: those passed down generationally and therefore *reinforced* by parents from the very start. The second wave of civil rights is for horizontal identities, those that people do not usually share with their parents and must therefore learn from a peer group. These are often the target of parental attempts at cure. First among these was the gay rights struggle. Deaf liberation came next. It has spawned a larger discourse about disability and difference, just as the fight of African Americans for inclusion fueled a broader conversation about multiculturalism and diversity. Each of these progressive transformations has aspired to twin objectives: to foster *celebration* among those directly affected by given conditions and to increase *tolerance* among the general population. The two goals are linked: personal exuberance is facilitated by an open society, and social acceptance emerges when the people directly affected have good self-esteem.

The question around Deaf Gain, then, is twofold: how can deaf people learn to notice and exploit their gain, and how can hearing people come to appreciate Deaf Gain? The first goal has already been served for decades; outreach and educational efforts must continue for a new generation, but the essential techniques for fostering deaf people's self-esteem are established, if not always practiced. The mission of converting a population outside the deaf world will be tougher. Most people who have hearing are unwilling to believe that a deaf life can be as good as a hearing life. Because they would not want to experience the trauma of *hearing loss,* they cannot easily reconcile themselves to the idea of *Deaf Gain.* Many fail to reckon with the fact that most deaf people have not *lost* their hearing but simply do not have hearing, just as most hearing people have not *lost* their Deafness but simply don't have it. Hearing people fear being late-deafened, because they have grown accustomed to a speaking world, and anxiety prevents them from appreciating how different the experience of people deaf since early childhood is from their apprehensive fantasies of losing grasp of their familiar means of perception.

I am well placed to recognize Deaf Gain, because I am gay. Most straight people wouldn't wish to be gay, just as most hearing people wouldn't wish to be deaf, yet both gay culture and Deaf culture are cherished by those who participate in them. Each also involves a voyage of discovery. I progressed from hating my sexual orientation to being happy in the gay life, marriage, and family I have. I have lived, as it were, Gay Gain: people I met because I am gay; a sensibility I developed because of my citizenship in that nation of difference; love stories that have been formative and even ecstatic for me; a feeling of community specific to having a difference of relatively low population frequency. This narrative will resonate with many deaf people. I have likewise suffered from prejudice, as most deaf people do. I had to fight both the bias of the external world and my own reflexive homophobia, much

as deaf people fight social and internalized ableism. Overall and on balance, however, my midlife experience is that I wouldn't give up my life for another one, and I am loath to imagine my Gay Gain out of existence. Deaf Gain opens the door to a broader notion of identity gain that can be applied to a range of other conditions.

I don't have Deaf Gain, but I am one of the fortunate hearing people who has been able to witness it, so I know something of what I'm missing. I believe that I am made richer by the simple fact of having clocked the merit present in what most people still presume to be a deficit. This book elucidates that argument elegantly.

EDITORS' NOTE ON TERMINOLOGY

Scholars researching deaf communities often capitalize the word *Deaf* when referring to people who use sign language and consider themselves members of a cultural community, whereas the word *deaf* (lowercase) describes the larger group of people who cannot hear. Such a distinction may be easy to represent typographically, but scholars grapple with the complexities of applying this distinction to diverse peoples and societies who share a wide variety of experiences of being deaf. Although the convention of *Deaf* is still in use, some scholars prefer *deaf* as an all-encompassing term to represent more than an audiological state.

Deaf Gain: Raising the Stakes for Human Diversity adopts a heterogeneous approach, reflecting the current state of flux in the use of *D/deaf* within deaf studies. We have allowed contributors to determine their own conventions regarding this politicized orthographic practice. As editors, we consider the term *deaf* to refer to all deaf people, including those who use sign language and self-identify as members of the deaf community. In this volume, *deaf* refers predominantly to culturally deaf people but does not necessarily exclude those who do not sign, who are hard of hearing, or who do not self-identify as members of a deaf community. Other meanings of *deaf* should be apparent from the context in which the word is used.

DEAF GAIN
An Introduction

H-DIRKSEN L. BAUMAN AND JOSEPH J. MURRAY

> As a source of exchange, innovation and creativity, cultural diversity is as necessary for humankind as biodiversity is for nature. In this sense, it is the common heritage of humanity and should be recognised and affirmed for the benefit of present and future generations.
> —*Article 1, UNESCO Universal Declaration on Cultural Diversity, 2001*

Aaron Williamson began to lose his hearing at the age of seven. Having spent the rest of his childhood in visits to audiologists, he now wonders, "Why had all the doctors told me that I was losing my hearing, and not a single one told me that I was gaining my deafness?"[1] This is, to be sure, not a common question. Common sense tells us that *deaf* is defined by the loss of hearing. A visit to any dictionary confirms that there is no way to conceive of deafness other than through the loss of the auditory sense. Yet this definition is not always so common and does not always make sense among those who are deaf.[2] Rather than defining their particular sensory orientation in relation to a norm of hearing, deaf individuals live within the plenitude of their particular sensory orientation and languaculture.[3] To many in the deaf community, being deaf has nothing to do with "loss" but is, rather, a distinct way of being in the world, one that opens up perceptions, perspectives, and insights that are less common to the majority of hearing persons. The biological, social, and cultural implications of being deaf are not automatically defined simply by *loss* but could also be defined by *difference*, and, in some significant instances, as *gain*. In order to explore this notion, the editors of this volume coined the term *Deaf Gain* to counter the frame of hearing loss as it refers to the unique cognitive, creative, and cultural gains manifested through deaf ways of being in the world.[4]

"Deaf" within the Framework of Normalcy

The shift from hearing loss to Deaf Gain is only one instance of a larger paradigm shift in thought from an overarching framework of normalcy to one of diversity. As Lennard Davis and others have shown, the invention and enforcement of standards of normalcy gained ascendency within the industrial nineteenth century

and have continued to be a dominant means of measuring and defining human biological, psychological, and cognitive abilities.[5] The concept of "normal" emerged as a way of understanding human beings only between 1840 and the 1860s, with the emergence of statistical science as a way of measuring human populations. Physical attributes of humans were, for the first time, graphed onto a plot called a bell curve, signifying a distribution in which the majority of subjects are grouped in the center and a correspondingly small number of people are, in each measurement, further out from the center. The bell curve became seen as a "natural" way of understanding human populations and seeped into public-policy-making discourse.

The concept of normalcy was not only about the majorities but also about defining the margins at either end of the curve. A child whose school test results lie on the high edge of the curve will find it easier to apply for scholarships and be granted admittance to prestigious schools. A child whose IQ test scores show learning difficulties will be labeled as intellectually inferior and find such opportunities more difficult to attain. Self-described progressive scientists and reformers of the late nineteenth and early twentieth centuries advocated bringing the "negative" ends of the curve into normalcy, whereas some eugenicists advocated more extreme measures.

This "age of normalcy" has had profound implications for Western deaf communities. Although American deaf education was conducted in sign language for much of the nineteenth century, for most of the following century educators forbade its use in the classroom and tried to abolish its use among deaf people. This philosophy, called oralism, fit in with a particular approach to biological difference—one that is intent on fixing, rehabilitating, and minimizing the distance between the normal and what is seen as pathological. When infants are born into institutions, such as hospitals, that strive to maintain normalcy, they are set on a trajectory of measurement, diagnosis, and rehabilitation. Upon identifying the precise nature of loss, a medico-educational approach to rehabilitation is put in place. This increasingly involves technological interventions such as cochlear implants, electronic devices implanted into the inner ear that stimulate a semblance of hearing via electronic signals. Pediatric implantation was controversial when it became a relatively common practice in the 1990s, and the controversy was due in no small part to the overblown claims that deaf children with implants were no longer audiologically deaf. Within the framework of normalcy, which insists upon pushing individuals into standard bodies, cochlear implants were an ideal device with which to extinguish the existence of a signing deaf community. This goal was publicly acknowledged by Gerald E. Loeb, a self-described coinventor of the cochlear implant, who predicted in 1993 the "extinction of the alternative culture of the Deaf, probably within the decade."[6] Loeb's prediction was wrong, but he accurately illustrates the point that those who promoted cochlear implants saw no harm in eliminating sign language and Deaf culture. The

approach of normalizing deaf individuals has become so pervasive that the use of sign language, a naturally occurring human language, is often discouraged.

Currently the rapid increase of medical interventions—cochlear implants and educational programs that focus exclusively on auditory and oral education—threaten to cause a precipitous decline in numbers of sign-language users. A November 2011 conference cohosted by the World Federation of the Deaf and the European Union of the Deaf took up the question of whether sign languages could be considered endangered languages. Although no sign language currently approaches the status of an endangered language according to UNESCO's measurement of language vitality, a number of presenters at the conference made it clear that their sign languages were in danger under a key measurement of language vitality: intergenerational transmission.[7] In Denmark, Janne Boye-Niemelä, the president of the Danish Deaf Association, pointed out that there has been a rapid decline in the number of children attending schools for deaf people, a decline of 20 percent within the past decade in nearly every school or program for deaf children. Even in those programs which continue to include deaf children, sign language is not used as a language of education. The opportunity for sign-language transmission in the schools has declined so precipitously that the world has now seen its first sign-language refugees, with seven deaf children having moved from Denmark to Sweden with their families in order to receive an education in sign language in Sweden, something no longer available in their country of birth.[8]

The decline of sign language is not inevitable. It is, however, logical within the framework of normalcy, for such a framework sees sign language as a type of prosthetic, a compensation for the loss of hearing, and if this can be even partially remediated, then there is little need for anyone to use sign language. This is the crux of an argument advanced against bilingual education for deaf children—that if they can get by with one language, then there is no need for them to be bilingual in both their national signed and spoken languages.[9] But instead of conceiving deafness as a deviation from a norm of hearing, it may be seen as one particular way of being that is no less human, or no less valid, than any other. The concept of normalcy does not do this, but there is a different framework available, one that predates the invention of the regime of normalcy by thousands of years: that is the fundamental condition of *biocultural diversity*.

"Deaf" within a Framework of Biocultural Diversity

We are perhaps most familiar with the notion of biological diversity, as our earth is home to an astounding array of genetic variation, with more than one and a half million identified plant and animal species and millions more yet to be discovered. The number of mollusk species alone—85,000—is incredible, not to mention 12,600 varieties of ant, and between 7,000 and 10,000 kinds of mushroom. As biologists have made abundantly clear over the past few decades, one of the prime indicators of the health of an ecosystem is the genetic variation that exists

within it. In contrast, a decrease in biodiversity results in the condition of monoculture, in which ecosystems become increasingly fragile and vulnerable to widespread degradation and disease. This may be the case for ecosystems, but what are the implications for human well-being?

Although biologists have long recognized the fundamental nature of biodiversity, we have only begun to recognize the deep connection of biological diversity with linguistic and cultural diversity, resulting in a new field of study: biocultural diversity. As Daniel Nettle and Suzanne Romaine write, "Research has shown quite striking correlations between areas of biodiversity and areas of highly linguistic diversity, allowing us to talk about a common repository of what we will call *biolinguistic diversity*: the rich spectrum of life encompassing all the earth's species of plants and animals along with human cultures and their languages."[10] Although this correlation has been observed for some time, recent research has verified the correlation through a larger and more accurate set of data.[11] Results from this large set of data indicate that biodiversity hot spots and wilderness areas often contain significant linguistic diversity, amounting to 70 percent of all languages on earth.

This correlation also holds true for the statistical decline of biological and linguistic diversity. Biologists have estimated that biodiversity loss is currently occurring at rates one thousand times greater than historic rates, and linguists estimate that some 50 to 90 percent of the world's languages will be gone within the century.[12] We are more familiar with the negative implications of monocultural farming practices on biodiversity, whereas we are less aware of the effects of loss in linguistic and cultural diversity. If greater biodiversity is an indicator of the health of an ecosystem, the correlation suggests that greater linguistic and cultural diversity is an indicator of the health of a social ecosystem. In a publication sponsored by UNESCO, Tove Skutnabb-Kangas, Luisa Maffi, and David Harmon explain that "[l]inguistic diversity is . . . our treasury of historically developed knowledge—including knowledge about how to maintain and use sustainably some of the most vulnerable and most biologically diverse environments in the world."[13] As we continue to lose languages at an accelerating rate, these authors warn, we destabilize the future of human flourishing: "From this perspective, fostering the health and vigour of ecosystems is one and the same goal as fostering the health and vigour of human societies, their cultures, and their languages. We need an integrated biocultural approach to the planet's environmental crisis."[14]

Given the correlation of biological and linguistic and cultural diversity, environmentalists and linguists may have much more in common than was previously assumed. Activists working toward the preservation of biocultural diversity often point to the very real knowledge of the local ecosystem that is contained within the language. Often, indigenous cultures possess an entire pharmacopoeia derived from local plants and manifested within a fully developed lexicon, such as the extensive Australian Aboriginal pharmacopoeia[15] as well as that of the Nahuatl.[16]

Also, consider the extensive knowledge of the land accumulated by the Saami from the northern regions of Scandinavia: after Nordic biologists announced their discovery that salmon could spawn in very small rivulets, the president of the Saami Parliament in Finland, Pekka Aikio, explained that the Saami have always known this, given that the name for rivulets in Saami means "salmon spawning ground."[17]

In addition to the ecological knowledge contained in languages, defenders of linguistic diversity also make the case that every language contains a worldview, a particular perspective on what it means to be human. This becomes evident as different languages place varying distinctions on aspects of experience. Kwakiutl, Turkish, and Hopi, for example, feature conjugations that make distinctions between hearsay and that which comes from the speaker's own experience.[18] Many Oceanic languages grammatically distinguish possession in terms of that which the speaker exercises control over and that which she does not. Some languages, such as Palikure in Brazil, use three genders, and others none. These are but a very few examples of the astounding semantic and grammatical complexity that provides "a rich source of data concerning the structure of conceptual categories and a window into the rich creativity of the human mind."[19]

The majority of the research and language-planning work within biocultural diversity focuses on spoken languages. Yet what about signed languages? Clearly, signed languages of deaf communities do not hold the ecological wisdom of indigenous languages of cultures that have been in intimate contact with their environment for a thousand years. Yet there is another mother lode of human diversity at work within signed languages and deaf communities. As will be seen throughout this book, users of sign languages contribute toward a robust diversity in their unique epistemological take on the world characterized by a visual-kinetic language and a host of embodied cultural behaviors and products that are virtually unknown to the rest of the world. Along with the emergence of sign-language studies comes a new perspective on cognitive, creative, and cultural production that increases the already astounding variation on ways to be human.

In this light, deafness looks less like a biological dead end than like another evolutionary adaptation. Deaf people, rather than representing a net loss to be fixed, represent instead one of the necessities of evolution. Consider that, for some reason, the 400-odd assorted genes for deafness have not been phased out over the past ten thousand years of human history. In this time, we have gone from walking on all fours to standing erect, from being cave dwellers in the hills of East Africa to loft dwellers in the concrete canyons of Manhattan. Evolutionary biology theorizes that all species evolve by natural selection, with genes not optimal for survival being weeded out either by their carriers' dying out or by carriers' not finding reproductive partners. Yet the gene for deafness has stubbornly persisted across thousands of generations and is found everywhere in the world. This alone should indicate that deafness is not an evolutionary error but a natural human

variation that continues to thrive.[20] One such "deaf gene," Cx26, has been found to be so persistent that biologists have sought to explore its properties in greater depth, finding that those individuals with two mutated copies of the Cx26 gene have thicker skin than those without. Studies have shown that the Cx26 gene is responsible for increased protection against infections from bacteria as well as accelerated healing of wounds.[21] This finding is akin to the discovery that the genetic mutation for sickle-cell anemia has been found to protect against malaria. This notion of the unexpected benefits arising from genetic variation encourages us to broaden our perspective to inquire into the multitudinous effects that a particular biological difference may bring about. When we look through the lens of biocultural diversity rather than normalcy, we are better able to move beyond the single story of deficit to the many stories of complex cause and effect. In this reckoning, what could be considered a pathological condition—deafness—could instead be seen as a contributor to a more robust social and cultural ecology.

Placing deaf studies within the frame of biocultural diversity provides a frame of reference that predates the frame of normalcy by some tens of thousands of years; it also expands the frame of biocultural diversity, which has yet to consider the epistemological and physical diversity inherent in the wider spectrum of minds and bodies in order to encompass the full range of human flourishing.

Diversifying Diversity: A Plurality of Minds and Bodies

The long civil- and human-rights struggles of underrepresented groups have resulted in increasing awareness of diversity along the lines of race, ethnicity, gender, sexual orientation, and economic class. Slowly, disability is making its way into the discourse of diversity. One factor in the slow recognition of disability within the category of diversity has been the deeply rooted assumptions of normalcy that manifest themselves as biological fact. Scholars in disability studies have been chipping away at the normalcy paradigm for some time now. An important early aspect of deaf studies and disability studies consisted of mounting a challenge to the early twentieth-century model of understanding disabled people called the medical model. Disability studies scholars posited a social model problematizing the fact that our societies are constructed around a particular bodily type—able-bodied men—and that it is this which excludes people with bodies that deviate from the norm. This social model has been particularly effective in raising issues of access and equity. The academic discipline of deaf studies took a different tack, with a focus on the cultural and linguistic uniqueness of deaf people. This understanding of deaf people has been enormously successful in spreading the use and awareness of sign language throughout many countries. Deaf people have benefited from greater social acceptance of sign language, including legal provisions for interpreting services that led to video relay interpreting and other forms of sign-language access. The social model emerging from disability studies and the deaf community's success in getting access to public spaces via sign lan-

guage show the creation of public spaces for discourses predicated on differently designed bodies.

In spite of these inroads, in common understanding, physical and cognitive differences are more frequently thought of as deviation rather than diversity. This can be illustrated by looking at citizenship debates in the nineteenth and twentieth centuries. In the United States, these were battles in which excluded groups sought to enter the center of American life, to reshape what it meant to be American in a way that made the term more inclusive. Whether they were Irish immigrants, Mexican immigrants, Quakers, African Americans, women, or lesbian, gay, bisexual, and transgender communities, the story remained the same: each group sought acknowledgment as part of the multiplicity of American life. However, in their citizenship battles, groups such as women and African Americans have shied away from being categorized with people who are physically different. And with good reason. Historian Douglas Baynton has pointed out that the exclusion of these two groups from political life was justified by using terms of disability. African Americans supposedly had lower IQs. Women were seen by medical professionals as naturally hysterical and likely to become more so if they had the audacity to try to get a college education. As Baynton writes, the idea of physical difference was used as a "justification of inequality." Political leaders of these groups did not challenge the idea that physical difference was a disqualification for inclusion in political life; they instead refuted claims that their groups were physically different.[22] The deaf community has been guilty of this as well, with popular discourse shunning the disability label while not challenging this medical model for those with "real disabilities."[23] The social and cultural models, as successful as they have been, cannot be said to have expanded the boundaries of normalcy in such a way that diversity is understood to encompass differently shaped minds and bodies.

The challenge for the inclusion of physical and cognitive diversity in our understanding of diversity is thus much greater than it ought to be. The inclusion of people with disabilities has become more common, but this inclusion is a form of diversity predicated on the hegemony of normalcy, which remains more or less the same. In an era when the discovery of the genetic causes of various conditions is front-page news, physical difference is still seen as something to be eradicated. American society accepts physical difference in currently existing individuals, but rejects it in future generations. To change this requires us to challenge the idea of normal and bring into its place a focus on physical and cognitive diversity as an essential element in our understanding of diversity.

In this work, the idea of Deaf Gain is joined by other concepts. An overlooked aspect of diversity is the astounding array of cognitive differences among humans. Thomas Armstrong and others have argued for a wholesale reevaluation of the human mind through the notion of neurodiversity. In his book *Neurodiversity: Discovering the Extraordinary Gifts of Autism, ADHD, Dyslexia, and Other Brain*

Differences, Armstrong writes, "[W]e need to admit that there is no standard brain . . . or standard cultural or racial group, and that, in fact, diversity among brains is just as wonderfully enriching as biodiversity and the diversity among cultures and races."[24] The notion of neurodiversity is not a "feel-good" way of addressing cognitive and psychological differences; rather, it is a recognition of the vastly different ways that the brain can operate, resulting in an understanding that some brains have abilities that those considered normative do not. This observation is buttressed by significant research in neurology and quantitative and qualitative research and, furthermore, is borne out by the marketplace, as evidenced in the hiring practices of companies that recognize that diverse minds perform some tasks far better than minds that allegedly fall within the normal spectrum.

Matthew Schneps, himself a dyslexic physicist, has investigated the trade-offs of dyslexia. People with dyslexia tend to place more attention on a whole visual field as opposed to the central focus of foveal vision necessary to follow a line of print. This opens the way for dyslexic individuals to exercise a greater ability to do comparisons of large amounts of visual material.[25] One specific documented outcome is the dyslexic person's ability to detect black holes at a more effective rate than nondyslexic scientists.[26] Such reversals of disability have filtered out to the public sphere, with the *New York Times* noting "the upside of dyslexia," where, among other things, people with dyslexia have been found to be overrepresented in fields that require scientists to process and understand large quantities of visual data, such as astrophysics.[27] The abilities rather than disabilities of neurodiverse minds were clearly evident to Hans Asperger as he identified the eponymous syndrome. "For success in science or art," he wrote, "a dash of autism is essential. The essential ingredient may be an ability to turn away from the everyday world, from the simply practical and to rethink a subject with originality so as to create in new untrodden ways with all abilities canalized into the one specialty."[28]

Further testimony to the practical uses of neurodiverse minds can be found in businesses in Denmark, Norway, Iceland, and Scotland, whose workforces mostly comprise those who are on the neurodiversity spectrum, especially those who are adept at detail-oriented tasks. One Danish software company, 75 percent of its workforce comprising individuals on the autism spectrum, claims that its rate of committing errors "was 0.5 per cent, compared with five per cent from other testers. That's an improvement by a factor of 10, which is why we can charge market rates. This is not cheap labour and it's not occupational therapy. We simply do a better job."[29] The neurodiversity movement is a key concept that stands to transform many long-held prejudices against a large segment of our population. At the same time, it, along with Deaf Gain, introduces a new aspect to the discourse on diversity.

Bodily diversity can be seen to serve as an impetus toward new inventions and new ways of thinking, thus benefiting society in ways otherwise overlooked. Measures to open up societies and public spaces to a wider range of bodily types, com-

monly framed in public policy as improving "access," has spurred a wide range of innovation. Curb cuts are useful to more than people who use wheelchairs. Closed-captioning has proliferated in public gathering spaces such as airports, stadiums, and restaurants, offering a visual replacement in noisy auditory environments. Disabled people, falling outside the boundaries of the normal, can serve as a stimulus to creating new technologies and new ways of thinking. Anthropologists postulate that things are not invented to meet needs but needs are discovered after something has been invented. A classic example of this is text-messaging, which was added to phones by engineers who envisioned limited phone usage.[30] The result is billions of text messages sent around the world on a daily basis.[31] Mara Mills has written of the extensive interaction between deaf people, deaf education, and the invention and refinement of sound and motion technologies in the late nineteenth and early twentieth centuries. In order to most efficiently convey sound in a mechanical format, such as in the telephone or phonograph, it was necessary to be able to show how sound was carried and perceived. This was the realm of oral deaf education, and scientists, including a deaf scientist, used tools from this field to refine their technologies. Deaf people were also seen as ideal subjects by which to test visual means of sound reproduction and were often consulted in the early experimental stage of new technologies. The phonoscope, a device considered to be "at the very origin of moving photography projection and the film industry," was developed by a scientist working out of the National Institute of the Deaf in Paris, France. The scientist was inspired to string together and project a series of photographs for deaf people to lip-read. From this, the world changed.[32] See also Mark Zaurov's chapter in this volume on Wladislav Zeitlin, a deaf German inventor who made significant advances that led to a breakthrough in visual media, the television.

As we seek to create a new rhetoric infused with an orientation of diversity rather than normalcy, we must explore a common vocabulary that allows for the accurate expression of key ideas. In this next section, we present broad categories of Deaf Gain that could be extrapolated to a host of cognitive, creative, and cultural diversities.

Deaf INCREASE / BENEFIT / CONTRIBUTE / AHEAD

The notion of Deaf Gain is inherently multidisciplinary, situated at the intersections of several fields: neuroscience, linguistics, sensory studies, history, art, architecture, and philosophy, among others. Deaf Gain is itself diverse. We do not posit a universal Deaf Gain. Which gains emerge or are valued are highly contingent on cultural and historical contexts, including the status of deaf people and sign languages in particular societies. The essays in this volume explore Deaf Gain across numerous contexts, but they represent neither the limits nor the universal application of Deaf Gain in other contexts.

In order to categorize its many facets, the editors have earlier written of the

Figure I.1 (*above*). DEAF. Signed by Mario Hernandez Jr.
Figure I.2 (*below*). GAIN or INCREASE. Signed by Mario Hernandez Jr.

cognitive, creative, and cultural dimensions of Deaf Gain.[33] In this next section, we explore a different ordering of the many aspects of Deaf Gain through a semantic categorization that emerges from signed languages rather than written languages. When the editors of this volume first coined the term *Deaf Gain,* the sign was used that signifies Deaf INCREASE. This sign signifies the broad category of gain—more of something than was originally present.

Within the semantic umbrella, there are more precise aspects to the nature of the gain; these include Deaf BENEFIT, Deaf CONTRIBUTE, and Deaf AHEAD. Each angle allows us to root the Deaf Gain concept in the lived experiences of different human bodies. The following are some highlights of each angle of approach.

Deaf Gain: BENEFIT

The first dimension of Deaf Gain we explore is that of the benefit to the individual. Whereas popular constructions of deafness are defined exclusively by the negative effects—problems with literacy development and social and cognitive development—a Deaf Gain perspective brings forth a number of social, psychological, and cognitive benefits. In calling attention to Deaf Gain benefits, we are not claiming that it is necessarily better to be deaf than to be hearing, but we are saying that it is not necessarily better to be hearing than deaf. Often-cited benefits experienced by deaf individuals are those in the realm of visual processing and visual attentiveness. As detailed in the chapter by Matthew Dye in this volume, these gains include enhancements in spatial cognition, facial recognition, peripheral process-

ing, and speed in detecting images. Such visual acuity is not the exclusive interest of neurological researchers but has been recognized as an attribute sought after in certain professions. The government in Oaxaca, Mexico, for example, has invested $4.4 million to install 230 security cameras that are monitored by deaf and hard-of-hearing police officers. Ignacio Villalobos Carranza, deputy secretary for the Ministry of Public Security of Oaxaca, noted that "these police officers have a very strong deaf and visual sense and can better detect what is happening in different places where the cameras are located."[34] Although more research is needed to determine the degree of deaf advantage in deterring crime, such an investment may be the beginning of a Deaf Gain economic advantage.

In addition to the well-documented research on visual-processing gains come the psychological benefits of interpersonal connections formed through prolonged eye contact.[35] Because signing is a visual language, the eyes must at all times be focused on the signer, as opposed to the method of hearing individuals, who can communicate for hours on end without once looking at each other. Psychologists have long recognized the psychological benefits of relationship building that result from direct eye contact, beginning with mother–infant attachment and self-regulation for belongingness to social situations.[36] In situations where mother–infant eye contact is not sustained or is frequently interrupted, disturbances occur in attachment as well.[37] Although Deaf Gain psychology has not been the focus of this research, one could uncover ways in which hearing people would have much to learn from the ways in which deaf people use their eyes to establish connections with others.

This notion of a deep interpersonal engagement among members of the deaf community is explored most fully by Robert Sirvage, who has investigated the embodiment of reciprocity that arises when two or more deaf people engage in conversation while navigating through space.[38] Because eye gaze must be fixed on the signer, those who are signing will also widen their visual field to ensure the safety of others. Often this behavior is fully conscious, as when one participant warns another about an upcoming obstacle; but there is also a subconscious, reflexive interaction taking place, in which participants use the determinants of a fixed

Figure I.3. BENEFIT. Signed by Mario Hernandez Jr.

signing space in order to push or pull participants around obstacles. On the surface, this may seem like a minor cultural behavior, but when considered further, it becomes a generous way of being-in-the-world in which deaf individuals hold each other in a visual embrace of well-being and safety. This requires a level of empathy and understanding of the other's well-being at all times. In living a lifetime in such intracultural eye contact, a level of intersubjective engagement occurs that, when multiplied on a larger cultural level, results in a collectivist cultural organization, as is discussed by Elizabeth Lockwood in this volume.

One of the most popular hearing constructions of deafness is the projection of a life of social isolation. Yet anyone who has spent time within the deaf community knows that the opposite is true. As Megan Matovich has put it, the deaf person is a "citizen of the world,"[39] a transnational traveler par excellence.[40] Being visual citizens of auditory nations, deaf people are accustomed to navigating in cultures other than their own and are able to use gestural abilities to communicate with hearing people, who are from a different language community. Accustomed to being in the minority and being the object of staring, culturally deaf individuals are particularly adept in fulfilling experiences such as the Peace Corps. Deaf American Peace Corps volunteer Kelly Rogel writes of being a member of Kenya's "forty-third tribe" during her time in the country. Kenya has forty-two officially recognized tribes, with sign-language-using deaf Kenyans considering themselves an unofficial forty-third tribe. And Rogel, as a deaf person even "8,500 miles away from the States, in a different hemisphere, at the equator," still identifies as a member of this tribe, as having found "a piece of home" far from her country of citizenship.[41] Moreover, being deaf opens up a global network of deaf people with whom one can interact in International Sign. Deaf travelers to other countries can meet local deaf people, communicate with them without needing to learn the local language, and generally gain a greater set of cultural tools to use in their travels.

One of the editors, Dirksen Bauman, who is hearing, has traveled with both hearing and deaf groups and reports that the difference is stark. As a hearing individual traveling with hearing people in a country with an unknown language, he is reduced to the status of a tourist, observing the visual surface of urban and rural landscapes. Travelling with deaf individuals, however, immediately carries him deeper into the cultural life of the country and its people. Further testimony to the Deaf Gain benefit of being a citizen of the world are the international gatherings of deaf people, in which deaf people from multiple nations interact in the same space over a limited period of time. Again, the lack of linguistic barriers and common visual ways of being allow for more in-depth exchanges than would otherwise be possible to hearing people in the same environment. A delighted Danish participant in the 1900 World's Congress of the Deaf in Paris noted, "With the help of the sign language, a deaf-mute from Karlskrona [Sweden] can converse

quickly and without difficulty with a deaf-mute from Chicago even if they don't understand a syllable of each other's written language."[42] These transnational benefits have been seen from at least as far back as the Parisian deaf-mute banquets of the early nineteenth century, to deaf craftsmen who traveled Europe using local deaf communities for tips on employment opportunities, to the present-day world's congresses of the World Federation of the Deaf.[43]

In addition to the intersubjective and transnational gains, deaf individuals have observed that there are other benefits to being deaf that are manifested through greater personal reflection and focus. Pierre Desloges, the eighteenth-century Parisian bookbinder, wrote that "nature has not been as cruel to us as is commonly assumed; it always compensates in one of the senses for what is absent in the others. The privation of hearing makes us more attentive in general. Our ideas concentrated in ourselves, so to speak, necessarily incline us toward reflectiveness and meditation."[44] Rather than perceiving his own deafness as a negative experience, Desloges noted that it sharpens reflection. Desloges's claim about greater attentiveness and reflectiveness is not unlike Thomas Edison's claim "This deafness had been of great advantage to me in various ways."[45] Although this ability of concentration is anecdotal, one cannot doubt the validity of Desloges's or Edison's experience, given that both had intimate experiences of being productive deaf members of their societies.

These individuals are not the only ones who have borne out the variety of productive benefits of being deaf. In her chapter in this volume on deaf workers at the rubber factories of Akron, Ohio, Kati Morton shows that hearing employers were eager to hire deaf workers, seeing them as having better vision and manual dexterity. Nearly a century later, training executives are using Deaf Gain attributes to train managers to be more effective leaders. One such trainer, Bruno Kahne, has modeled a leadership-training program after communication habits of the deaf he has observed. He extols the benefits of maintaining eye contact, being sensitive to the protocols of turn taking, communicating with direct, economic speech, and staying focused. In his book *Deaf Tips: Twelve Lessons from the Deaf World to Improve Your Communication in Your Personal, Social, and Professional Life,* Kahne presents findings from interviews and research that support the position that deaf individuals could serve as mentors to hearing individuals when it comes to communication.[46]

Taken together, these attributes of Deaf Gain—enhanced and prolonged eye contact, intersubjective engagement, collectivist social patterns, transnational bonds, less auditory distraction, and acute visuospatial aptitudes—all contribute to a new perspective on what it means to be deaf. By calling attention to these gains, we are not making the case that hearing individuals should intentionally become deaf; but we do call into question the reverse notion, that deaf individuals should intentionally become hearing.

Figure I.4. CONTRIBUTE. Signed by Mario Hernandez Jr.

Deaf Gain: CONTRIBUTE

In addition to the individual benefit of being deaf, the existence of deaf / sign-language communities confers specific gains to humanity as a whole. Deaf CONTRIBUTE refers to the contributions of deaf individuals, communities, and their languages to humanity as a whole. In the most general sense, the existence of deaf people and communities contributes to a more robust biocultural diversity, as has been discussed. Testimony to the value of such diversity are the new perspectives on human nature that have arisen from the study of signed languages.[47] Along with other long-standing human misunderstandings, such as that the earth is flat and that it lies at the center of the universe, a more pernicious misunderstanding has been that speech is the sole form of human language. With the revelation of the fully developed grammatical system of signed languages in the 1960s, the human capacity for linguistic expression was radically transformed.[48] In the wake of this paradigm shift, a new map of the brain has been drawn, one which shows that language is actually formed through deeper neurological patterning than auditory patterning exclusively, and is wholly independent of any one modality.

This revolution in understanding the biological properties of language is explored in greater depth in Laura-Ann Petitto's chapter in this volume. In short, as William Stokoe has shown, speech is no longer a necessary condition for language but, rather, a sufficient condition for language, a point that is explored more fully in this volume by David Armstrong.[49] Contributions that are explored in the pages throughout this volume include a deepening of what it means to be bilingual and multilingual, as explored by Ofelia García and Debra Cole; the number of insights that have resulted from the emergence and study of signing communities, explored by Annelies Kusters; and the historical uses of sign language and gesture to foster intercultural communication, as noted by Clara Sherley-Appel and John Bonvillian.

These are foundational and transformative contributions that have resulted from the existence of deaf and signing communities. Such an opportunity to explore the nature of human language could never occur with spoken languages, as

any new, emerging language would be considered a dialect or creole of a previously existing language. Because deaf children do not access the dominant spoken language, they are ripe to generate a language from the innate capacities with which we are all endowed. This is clearly a contribution from deaf communities that is long lasting and paradigm shifting. We now have a more complete understanding of the human capacity for language. In short, we now know that "to sign is human."[50]

Deaf Gain: AHEAD

The sign for Deaf Gain AHEAD might be better translated into English as "taking the lead." The sign begins as one hand is behind the other, signifying the hearing-loss perspective that traditionally frames deaf individuals as being delayed and at a disadvantage. However, the hand that is previously behind moves ahead of the other, assuming the position of a vanguard. In several of the examples listed earlier, it may be understood that deaf people are either poised to transform or have already transformed their benefits and contributions into the public sphere in ways that represent thinking that is ahead of their hearing counterparts. We have earlier seen how disability has been a stimulus to innovation, with the design and application of new inventions. Indeed, if one considers some of the major technological advances of the past century, deaf people have been involved to one or another degree. The inventors of Morse code and the telephone both had deaf wives. Thomas Edison, who was deaf, invented the light bulb and refined the conduction of electricity. Wladislav Zeitlin, as mentioned previously and later in this volume, invented technologies influential in the making of the television. Vincent Cerf, credited as a "father" of the Internet, is deaf. Can one imagine the past 150 years of human society without these inventions? Although one does not need to be deaf to invent, and none of these inventions necessarily hinged on deafness, the parallels point to ways in which being deaf may be a contributing factor. The following examples, which are in various stages of being realized, stand to have very real applications, resulting in what could be described as a "Deaf Gain economy"

Figure I.5. AHEAD. Signed by Mario Hernandez Jr.

supported by Deaf Gain consultants in a variety of niche areas, or by Deaf Gain businesses.

One realm in which deaf individuals may bring to bear their visual and spatial perceptual acuities is the field of architecture. As detailed by Hansel Bauman in this volume, the DeafSpace movement, as it is known, has far-reaching implications for architectural design principles as well as the very process of design. As a result, it is not outlandish to imagine that architectural firms would actively seek out DeafSpace-trained architects and urban planners to lend their eyes and perceptions. Another related dimension to DeafSpace design is the potential for deaf people to work as lighting specialists. From a young age, deaf individuals are keenly aware of their bodies in relation to light, as they often need to negotiate and create lighting environments in order to communicate effectively through sign language. This would be the equivalent of negotiating the auditory environment in order to speak; yet, unlike distracting noises, lighting issues are omnipresent. Thus, Melissa Malzkuhn has offered the notion of creating a group of deaf "light detectives" who explore and consult on the improvement of the lit environment.[51]

Another realm of Deaf Gain AHEAD is literary expression. As has been recognized previously,[52] sign language represents a medium of literature that has qualities that have been sought after for centuries: increased visual forms of textuality as well as a return to oral, performance, and embodied texts. At one and the same time, the sign-language literary text is visual and embodied, representing a synthesis of what poets and writers have long been searching for. One such testimony to the Deaf-AHEAD nature of sign-language literature is the reaction of Allen Ginsberg when he witnessed a translation of the phrase "hydrogen jukebox" from his poem "Howl" into sign language.[53] Ginsberg was astonished at the precise, concrete, and creative imagery that resulted from a jukebox revved up to the point of a mushroom-cloud explosion of a hydrogen bomb. He felt that sign-language poetry does what he and his fellow poets have been trying to do—create clear images. For centuries, poets have been experimenting with ways to make their texts increasingly visual—from Horace's *ut picture poesis*, a comparison of poetry and painting, to Blake's illuminated manuscripts, to concrete poetry. There is a more recent desire for a return to an embodied, performative oral poetics through spoken-word poetry and the burgeoning scene of poetry slams. Sign-language poetry represents a synthesis of deep yearnings for a visual, embodied literary medium. In addition, visual/gestural theater is another realm in which deaf individuals could be considered vanguards. The traditions of mime and silent theater could be pushed to new levels through the hands and bodies of individuals who spend their lives communicating in a gestural medium. Such performances can be witnessed frequently at international deaf arts and theater festivals, where national deaf-theater companies produce works that are seen and appreciated by audiences all over the world. For more on signed literature, see Rachel Sutton-Spence's chapter in this volume.

Aligned with the Deaf Gain AHEAD advances within the arts, film is another area of particularly rich contributions from deaf sensibilities. As has been written about previously, there are deep, perhaps homological affinities between signed languages and film languages.[54] As originally described by Bernard Bragg and written by William Stokoe, "In a signed language . . . narrative is no longer linear and prosaic. Instead, the essence of sign language is to cut from a normal view to a close-up to a distant shot to a close-up again, and so on, even including flashback and flash-forward scenes, exactly as a movie editor works."[55] Given the fact that those who grow up signing construct cinematic narratives every day of their lives, if they were to be given cameras and editing programs from a young age, imagine what sort of filmmakers would grow from this community. One example of a culturally deaf aesthetic within filmmaking can be seen in the short film *Gallaudet*.[56] Again, Deaf Gain filmmakers and consultants could bring their own sensitivities to bear on film and video production.

The insights that come from thinking, creating, and producing in a visual gestural medium could also be mined for advances in teaching and learning, particularly in regard to the notion of multiple intelligences. The potential contributions of deaf people in visual learning are now beginning to be uncovered, thanks in part to a National Science Foundation Science of Learning Center founded at Gallaudet University called Visual Language and Visual Learning, or VL2. This area of inquiry is long overdue, given the advances in understanding multiple intelligences and the critical role that gesture and vision play in cognition and learning. The work of Susan Goldin-Meadow is instructive here, as she has shown how gesture is a key factor in increasing student retention.[57] Goldin-Meadow's decades of research align with what neuroscientists are now recognizing as the vital role that the hand plays in the development of intelligence. "Any theory of human intelligence," writes Frank Wilson, "which ignores the interdependence of hand and brain function . . . is grossly misleading and sterile."[58] A Deaf Gain education that seizes on the sophisticated visual gestural medium of signed languages stands to reawaken the fundamental relation of hand to intelligence. Further, we know that the information received through the eyes and sent to the brain via the optic nerve is comparable to a superhighway compared to the smaller input that occurs through the ears. In an increasingly visual age, understanding how to decipher visual data and become visually literate is becoming an imperative in education.

As a result, we can envision a future in which deaf education is replaced by a Deaf Gain education, where traditional deaf residential schools could become elite boarding schools in which any child in pursuit of a rigorous visual- and gestural-based, bilingual education could be welcomed. As with the phenomenon of "baby signs," explored in this volume by Kristin Snoddon, there is no reason why such centers of visual learning would not attract parents eager to give their hearing children a competitive advantage in the future. Research shows gains in both deaf and hearing children's reading development when they learn sign language.[59] The

curriculum, as well, could emphasize particular areas of visual, spatial, and tactile pursuits, leading to such Deaf Gain professions as architecture, film, education, theater, and video-gaming design. The chapter by Hilary Sutherland and Katherine Rogers, in which they explore the benefits of deaf researchers, is in this vein, as is Peter Hauser and Geo Kartheiser's chapter on the benefits of signing for deaf and hearing people.

The interface of Deaf Gain with digital technology is emblematic of a longstanding vanguard relationship of deaf people to technology. Deaf people were the first to use the medium of film for propaganda and information purposes;[60] they were among the first to make the leap from blogs to vlogs, or video blogs. Although deaf individuals are often early adopters of visual communication technologies, they have not always participated in the invention. There could be a host of additional insights into the visual and gestural interface with technology to come from a Deaf Gain perspective. Increasingly, gesture is being used as a means of communicating with screens. Different visual–manual interfaces, such as the iPhone and other gestural interfaces, have yet to take full advantage of the more sophisticated system of signed languages, a fact recognized by Microsoft, which has filed a patent exploring potential uses of sign language with its Kinect technology.[61] Who would be better suited to envisioning such products than those who use sign language every day? Perhaps the greatest contribution would be that deaf people could represent a way of adapting to the skills needed in a digital world while maintaining the face-to-face contact, which is a hallmark of the deaf community. They are able to straddle both arenas in ways that hearing people would do well to emulate.

The aforementioned examples of Deaf Gain AHEAD are by no means exhaustive. Many more could be cited and elaborated. Together they point toward a larger ethical advance that aligns with the neurodiversity and biocultural diversity movements: a greater appreciation of the deep value of human diversity rather than human monoculture. Freeing ourselves from the shackles of normalcy, we are now more able to see how Deaf Gain can change the ways in which we appreciate the gifts of all humans. Although this may seem dramatic, the recent history of the social model shows that we have only begun to tap into the ways in which physical diversities enhance our world.

The first step in integrating people with disabilities into society has often taken the form of what are known as "accommodations." As we noted earlier, accommodations designed for disabled people, such as curb cuts and subtitles, are found to benefit others as well. The multiple applications of accommodation are one example of the gain society receives from ensuring that differently shaped bodies and differently organized brains are seen as a part of human diversity. We can now imagine replacing deaf education's dreary focus on remediating hearing loss with a Deaf Gain–focused education that maximizes the visual-spatial-kinetic nature

of deaf ways of being and the use of sign language to produce cosmopolitan, technologically savvy, yet collectivist global citizens who live in a deep, intersubjective reciprocity with fellow citizens of the world.

A Map of the Book

The editors have developed the idea of Deaf Gain over time, beginning with presentations in American Sign Language (ASL) to scholars and students at Gallaudet University in 2009. The concept was being used in the American deaf community before our first academic publication on Deaf Gain came out, in 2010.[62] Since then, we have published and given presentations on Deaf Gain in several languages, including International Sign, around the world. As justifies a concept developed around a signing community, we have seen the notion of Deaf Gain spread throughout deaf communities around the world. It is even being used as a narrative device in a prime-time television series, *Switched at Birth*.[63]

This volume is notable for its diversity of contributions on a topic about diversifying diversity. Contributions include perspectives from neuroscience, ethics, legal studies, sensory studies, literature, art, architecture, and history. This volume could have been even larger than it is, for we are only now beginning to understand the many gains brought about by deaf ways of being in the world. As is likely the case among such a large number of contributors, there are underlying differences in their approach to topics. Some chapters directly challenge essentialist constructions of knowledge, whereas other chapters present evidence that suggests essential biological characteristics that have been misunderstood over time. We let the chapters speak for themselves. The differences that become evident among writers invite rich dialogue about the nature of biological and social constructions. In this section we present a short map of twenty-seven explorations of the new territory of understanding human difference, Deaf Gain.

This volume begins with "Philosophical Gains," in which authors reflect on issues of Deaf Gain, normalcy, bioethics, essentialism, and legal theory. The first chapter, Teresa Blankmeyer Burke's "Armchairs and Stares: On the Privation of Deafness," offers an opening salvo in the paradigm shift of Deaf Gain, asking readers to consider the privation of deafness—that is, the loss of being deaf that is experienced either by hearing individuals or by deaf individuals who use technology to increase their hearing. By welcoming readers into Burke's own experiences, Burke's chapter serves as a portal into this brave new world of robustly challenged assumptions of normalcy. James Tabery's "Identifying the 'Able' in a Vari-able World: Two Lessons" continues to challenge commonly held definitions that are based in essentialist constructions of norms. In providing a wealth of examples of the shifting terrain of allegedly objective conclusions based on genetic variations, Tabery argues for an antiessentialist stance that would also apply to definitions of Deaf Gain itself. One particularly poignant example of essentialist

conclusions about the pathological nature of deafness is the 2008 amendment to the United Kingdom's Human Fertilisation and Embryology Act (HFEA) of 1990. Alison Bryan and Steve Emery challenge the underlying ethical assumptions of the HFEA, which makes it illegal to increase one's chances of having a deaf baby when using fertilization procedures. As Bryan and Emery make evident, when a government decides what types of life are more worth living than others, the stakes in a Deaf Gain paradigm shift are quite high.

The second part, "Language Gains," explores what is perhaps the most prominent area of Deaf Gain: the redefinition of language. Laura-Ann Petitto has been at the heart of this revolution, which she describes in "Three Revolutions: Language, Culture, and Biology." The revelation that signed languages possess a fully developed grammatical structure was the first revolution, bringing about a revolution in the identity of the deaf community as well. Yet, Petitto argues, more recent discoveries in neuroscience have brought about a third revolution that challenges dogma relating to brain function: that signed and spoken languages are *biologically equivalent*—that is, the very same brain tissue is activated regardless of modality. This revolution places signed languages at the very core of the human capacity for meaning making. David Armstrong's "Deaf Gain in Evolutionary Perspective" makes a similar argument about the human capacity for gestural and signed communication, though from an evolutionary perspective. Although there is vast disagreement among theories of language origins, Armstrong argues that sign-language studies provides compelling rationale to make the claim that all language began through the gestural modality, making gesture a necessary component of language. Just as Petitto and Armstrong have argued for a redefinition of language, Ofelia García and Debra Cole argue in "Deaf Gains in the Study of Bilingualism and Bilingual Education" that their understanding of bilingualism and multilingualism has altered since considering the complex situation of deaf bilinguals, who "translanguage" across modalities. Given these redefinitions, a new and emerging understanding of language ideologies is in order. This is the point of Cindee Calton's chapter, "What We Learned from Sign Languages When We Stopped Having to Defend Them." Here, Calton explores the shifts in language ideologies that have come about since signed languages were determined to be fully developed languages, especially shifts in attitudes toward arbitrariness and iconicity in language.

The third part, "Language Gains in Action," continues to widen the circle of the paradigm shift articulated in Part II. If it is the case, as chapters in Parts I and II argue, that signed languages are as much a part of the human capacity for language as spoken languages are, it follows that hearing people as well as deaf people would stand to benefit from sign gains. Peter Hauser and Geo Kartheiser's chapter, "Advantages of Learning a Signed Language," provides an overview of the research pertaining to cognitive benefits that arise from the use of signed languages, parsing out what are deaf gains and what are sign gains. As with any

language learning, the greatest development occurs in the early stages of life. In her chapter, "Baby Sign as Deaf Gain," Kristin Snoddon delves into the research behind the popular phenomenon known as baby sign. She notes that the greater the fluency in a signed language, the greater the developmental gain; as a result, the most effective baby-sign program should involve Deaf or sign-language-fluent adults. Given the human proclivity toward signed and gestural communication, it stands to reason that both hearing and deaf people would have used this language long before there was a formal discipline known as linguistics. This is indeed the case, as Clara Sherley-Appel and John D. Bonvillian explain in their chapter, "Manual Signs and Gestures of the Inuit of Baffin Island: Observations during the Three Voyages Led by Martin Frobisher." The authors gain a glimpse into the widespread use of a gestural language among the relatively homogeneous and hearing Inuit in the late sixteenth century through the writings of a British explorer. About a century later, another British author, John Bulwer, published several books extolling the benefits of incorporating gesture and signed language into the rhetoric of public speaking. As Jennifer Nelson shows in her chapter, "Bulwer's Speaking Hands: Deafness and Rhetoric," Bulwer's *Chirologia* and *Chironomia* read like a seventeenth-century manifesto on Sign Gain. Having been influenced by deaf individuals, this rhetorician recognized a supreme Deaf Gain irony: that deaf people are the vanguard in the arts of eloquent discourse.

The fourth part of the book, "Sensory Gains," reviews the perceptual, neurological, and cultural implications of a deaf sensory orientation. The first chapter in this section, "Seeing the World through Deaf Eyes," by Matthew Dye, provides an overview of the research into visual cognition and deaf people, noting perceptual acuities in a host of specific visual tasks. Although the majority of research has been in the domain of visual processing, Donna Jo Napoli contends that there are significant heightened tactile sensibilities that are a part of the deaf experience. In her chapter, "A Magic Touch: Deaf Gain and the Benefits of Tactile Sensation," Napoli explores the research relating to deaf tactile gains in cognition and psychosocial development. Following Dye's and Napoli's overviews of research on neuroplasticity in the case of visual and tactile gains, Benjamin Bahan demonstrates how these sensory orientations form deep patterns of cultural behaviors. Bahan's chapter, "Senses and Culture: Exploring Sensory Orientations," could be seen as an exploration of cultural plasticity resulting from the fundamental condition of neuroplasticity. The following chapter moves from the scale of the influence of the senses on cultural formation to an individual inventor whose visual orientation guided him in pioneering research that led to dozens of patents and inventions influential in the development of the television. Mark Zaurov's chapter, "The Deaf Gain of Wladislav Zeitlin, Jewish Scientist and Inventor," explores Zeitlin's writings and career to foreground the role that his deafness and visual orientation contributed to the nature of his inventions. Finally, this section ends with a call toward a research practice mindful of Deaf Gain. Hilary Sutherland and Kath-

erine Rogers's chapter, "The Hidden Gain: A New Lens of Research with d/Deaf Children and Adults," examines Deaf Gain research practices that focus on the development and use of "visually reliant tools" as a method for collecting data that could reveal Deaf Gain aptitudes. Drawing on their experiences as Deaf researchers, they present specific cases where visual methodologies result in a view of Deaf abilities rather than disabilities. Together, these chapters on sensory gains provide insight into a deaf sensorium that is determined not by lack but rather by plasticity and visual and/or tactile acuity.

The fifth part, "Social Gains," explores Deaf Gain as it is manifested within particular sociocultural formations. One such formation is the phenomenon of "shared signing communities," where the common language is a signed language because of a high incidence of deafness. Annelies Kusters explores the lives within these communities in her chapter, "Deaf Gain and Shared Signing Communities." In doing so, Kusters cautions against forming an idealized image of these communities as Deaf Gain incubators; rather, she notes that there are competing discourses of loss and gain within these communities. She urges scholars to recognize this ambiguity as part of the reality of living within hearing–deaf intersections. Another complex point of hearing–deaf contact is found within the workplace, where traditionally, deaf employees have been subject to discriminatory practices and negative attitudes. However, Kati Morton's chapter, "Gainful Employment: Historical Examples from Akron, Ohio," documents historical instances in which employers actively sought to hire deaf workers, who were known for their manual dexterity and productivity. In company publications, Goodyear Tire Company officials noted that deaf workers were not distracted by conversation while performing manual labor. Such individual productivity may be contrasted with what is often cited as a collectivist social pattern among deaf communities. In her chapter, "Effective Deaf Action in the Deaf Community in Uruguay," Elizabeth M. Lockwood explores political activism within the Uruguayan Deaf community, noting the effectual nature of a collectivist social movement in achieving civil and human rights. On the same continent, a very different form of collective social formation is evident in the chapter by Ronice Müller de Quadros, Karin Strobel, and Mara Lúcia Masutti, "Deaf Gains in Brazil: Linguistic Policies and Network Establishment." These authors examine the ways in which the deaf community has led the way in forging greater recognition of linguistic and cultural pluralism with Brazil, as well as in the maintenance of cultural practices and connections through imagined spaces of distance learning. Evidence of connections among hearing individuals through the same distance-learning system indicate a Deaf Gain in taking advantage of technology as a means of forging (imagined) community. The section ends where it began, with a note on the ambiguities found in previous Deaf Gain literature. The final chapter of the section, "Deaf Gain: Beyond Deaf Culture," inquires about the deaf gains that occur among those who do not always identify as culturally Deaf. The authors, Irene W. Leigh, Donna A. Morere,

and Caroline Kobek Pezzarossi, question the assumption that Deaf Gain is largely due to the use of a visual-spatial language, given that the majority of individuals who are deaf and hard of hearing do not use sign language. This chapter encourages a closer examination of the lives of all deaf and hard-of-hearing individuals to identify instances of sensory and social gains.

The final part, "Creative Gains," turns the volume's focus toward Deaf Gain within the arts. One of the most significant gains has been within the field of architecture, known as DeafSpace. Architect Hansel Bauman, in "DeafSpace: An Architecture toward a More Livable and Sustainable World," examines the ways in which DeafSpace design principles result in an architectural pattern language that increases the sensory reach and sense of belonging and connection among a building's inhabitants. Bauman suggests ways that the highly collaborative DeafSpace architectural movement deepens current trends toward greater sustainability and livability. Deaf Gain within the design process is also the focus of Antti Raike, Suvi Pylvänen, and Päivi Rainò's chapter, "Co-design from Divergent Thinking." These authors use specific case studies in which design has taken place in a collaborative context with Deaf users of the design products. In addition to architecture and design, Deaf Gain can be registered within literature, music, performance, and the visual arts. Christopher Krentz explores what he calls "the hearing line" in "The Hearing Line: How Literature Gains from Deaf People." Inspired by W. E. B. Du Bois's notion of the color line, Krentz examines ways in which there is a hearing line within literature that cuts through such canonical texts as *Moby-Dick,* as well as the work of Deaf American writers. There is Deaf Gain in written literature, yet there are also profound gains in the very question of what constitutes literature. This challenge comes in the form of signed-language literature. Rachel Sutton-Spence's chapter, "Deaf Gain and Creativity in Signed Literature," explores signed poetry through the works of British Sign Language poets, demonstrating unique notions of anthropomorphism and embodied metaphor in their work. Although poetry is often considered to be closely aligned with music, such phonetic properties as rhyme and rhythm have their visual counterparts. This is not to say that deaf people do not gravitate toward music. Summer Loeffler's chapter, "Deaf Music: Embodying Language and Rhythm," wonders aloud whether Deaf culture is the only culture on the planet without its own musical tradition. She answers this rhetorical question with ample evidence of ways in which Deaf music challenges the essentialist notion that music is tied to sound. Finally, this section concludes with the voices of Deaf artists themselves. In order to examine the role of Deaf Gain within the artistic process, Jennifer Grinder Witteborg, in "Deaf Gain and the Creative Arts: Interviews with Deaf Artists," has interviewed a number of Deaf artists and performers on their perspectives of Deaf Gain and the artistic process.

The volume then concludes with an Afterword by Tove Skutnabb-Kangas, an internationally recognized leader in promoting linguistic human rights for

minority languages. Her concluding thoughts leave the reader with a call for a more radical embrace of biolinguistic diversity as one of the great human resources. For those interested in promoting greater human well-being, taking on the cause of minority languages and signed languages is one critical area of engagement in an age when languages are disappearing as fast as endangered species. As Skutnabb-Kangas notes, in biolinguistic-diversity advocacy, Deaf Gain finds a home of kindred spirits and communal engagement for the betterment of the world in maintaining a robust diversity.

Conclusion: A New Definition of Hearing Loss

Having dislodged the four-letter word *deaf* from its essentialist roots based in hearing loss, we have shifted the paradigm to the point where the words *hearing loss* take on a different meaning. In this sense, "hearing loss" refers to the loss that hearing people experience by not being open to the benefits, contributions, and advances that arise through deaf ways of being. Classic effects of hearing loss are a lack of comfort with eye contact, an inability to use the body as a means of communication, a long-standing misunderstanding of the nature of human language, and a tendency to maintain monolingualism throughout one's life. With ideological rehabilitation, the negative effects of hearing loss can be mitigated.

There is much that can be said about sign languages and signing communities, and much that we need to learn. But what we do know is that there exists a continuum of different social responses to the presence of deaf people. One response is to attempt to cure deafness or eliminate it. And there is a long history of attempted cures of deafness, ranging from religious healing to herbal cures to surgical cures such as the cochlear implant. Studies of deafness form an important part of genetic work, including attempts to both understand and alleviate genetic causes of deafness. Putting aside these attempts at removal of deafness and looking instead at adaptations, we see another continuum. On one end of the scale, we can place modern Western societies, with national communities of deaf people who consider themselves linguistic and cultural minorities and advocate for the same rights as similar minorities. On another end of the scale, we can place village communities in which the majority of people, both deaf and hearing, have learned to sign. In between, as noted in Kusters's chapter in this volume, are numerous ways to include deaf people and sign language in human societies. Both national and village communities have one thing in common: they show that human beings and societies are able to adopt to bodily difference, even to the extent of creating and adopting new modalities in which to express language. These societies expose the arbitrariness of societies built around the concept of normalcy. Societies organized around the restrictions of a particular type of walking, speaking, hearing body are artificial constructs. What is "natural" is the adaptation of human communities to difference.

Scholars are now realizing that deaf people have brought to the world unique

ways of living and being as visual beings. The multiple diversities of human knowledge have become increasingly important, as seen in a world where multinational corporations seek the medical knowledge of small Indian tribes in the Amazon rain forest. Forms of knowledge previously thought to be marginal are now being recognized as potentially significant in their contributions to humanity. In the case of deaf people, we go beyond documenting the factual knowledge of a particular culture to discovering new ways of being, to an understanding of a different cognitive take on the world. This directly challenges ideologies of normalcy and, more significantly, presents a strong argument against attempts to reduce genetic variations in human populations. In our unreflective haste to remove disability, are we ready to eliminate diversity from the human race? Deaf Gain, neurodiversity, and other attempts to redefine how we see the human form are not peripheral issues. In this book, we show how bodily diversity is central to our society's ongoing attempts to understand what it means to be human.

Notes

1. Aaron Williamson is a British performance artist. He asked this question during a lecture to a graduate class in deaf studies at Gallaudet University in 2002. His work can be found at aaronwilliamson.org.
2. A note on usage: as has become customary in deaf studies, the lowercase *deaf* refers to the audiological condition of deafness, whereas the capitalized *Deaf* refers to people who identify with the culture of deaf individuals.
3. For more on the notion of "languaculture," see Thomas Horejes, *Social Constructions of Deafness: Deaf Languacultures in Education* (Washington, D.C.: Gallaudet University Press, 2013).
4. H-Dirksen L. Bauman and Joseph J. Murray, "Reframing: From Hearing Loss to Deaf-Gain," *Deaf Studies Digital Journal* 2 (2009); and H-Dirksen L. Bauman and Joseph Murray, "Deaf Studies in the Twenty-First Century: Deaf-Gain and the Future of Human Diversity," in *Oxford Handbook of Deaf Studies, Language, and Education*, ed. Marc Marschark and Patricia Spencer, vol. 2 (Oxford: Oxford University Press, 2010).
5. See Lennard J. Davis, *Enforcing Normalcy: Disability, Deafness, and the Body* (New York: Verso, 1995).
6. See http://www.usc.edu/uscnews/experts/635.html for Loeb's description of himself as the coinventor of the cochlear implant. The description appears in a letter to the editor of the *Atlantic Monthly,* December 1993, 8.
7. Ad Hoc Expert Group on Endangered Languages, "A Methodology for Assessing Language Vitality and Endangerment" (UNESCO, 2003), a document submitted to the International Expert Meeting on UNESCO Programme Safeguarding of Endangered Languages, Paris, March 10–12, 2003. Retrieved from http://www.unesco.org/new/en/culture/themes/endangered-languages/language-vitality/.
8. Janne Boye-Niemelä, "The Current Status of Danish Sign Language" (paper presented at the conference "Sign Languages as Endangered Languages," World Federation of the Deaf and European Union of the Deaf, November 6–9, 2011, in Ål, Norway).
9. Harry Knoors and Mark Marschark, "Language Planning for the Twenty-First Century: Revisiting Bilingual Language Policy for Deaf Children," *Journal of Deaf Studies and Deaf Education* 17, no. 3 (November 2012): 291–305.
10. Daniel Nettle and Suzanne Romaine, *Vanishing Voices: The Extinction of the World's Languages* (New York: Oxford University Press, 2000), 13.

11. L. J. Gorenflo et al., "Co-occurrence of Linguistic and Biological Diversity in Biodiversity Hotspots and High Biodiversity Wilderness Areas," *Proceedings of the National Academy of Sciences (PNAS),* May 7, 2012, doi:10.1073/pnas.1117511109.
12. Ibid.
13. Tove Skutnabb-Kangas, Luisa Maffi, and David Harmon, *Sharing a World of Difference: The Earth's Linguistic, Cultural, and Biological Diversity* (Paris: UNESCO, 2003), 42.
14. Ibid.
15. Ella Mary Stack, "Aboriginal Pharmacopoeia" (occasional paper no. 10, Northern Territory Library Service, Darwin, Australia, 1989).
16. *América Indigena* 47, no. 2 (1987).
17. Skutnabb-Kangas, Maffi, and Harmon, *Sharing a World of Difference,* 36.
18. Nettle and Romaine, *Vanishing Voices*, 61.
19. Ibid., 60.
20. These ideas were raised by David Armstrong in "Deaf Gain in Evolutionary Perspective" (presentation at "Difference as Diversity," conference at Gallaudet University, Washington, D.C., April 2010). See also Armstrong, this volume.
21. D. P. Kelsell et al., "Connexin 26 Mutations in Heredity Non-Syndromic Sensorineural Deafness," *Nature* 387 (May 1, 1997): 80–83; Christian G. Meyer et al., "Selection for Deafness?" *Nature Medicine* 8, no. 12 (2002): 1332–33, doi:10.1038/nm1202-1332.
22. Douglas Baynton, "Disability and the Justification of Inequality in American History," in *The New Disability History: American Perspectives,* ed. Paul K. Longmore and Lauri Umansky (New York: New York University Press, 2001), 33–57.
23. Tavian Robinson, "We Are of a Different Class: Ableist Rhetoric in Deaf America, 1880–1920," in *Deaf and Disability Studies: Interdisciplinary Perspectives,* ed. Susan Burch and Alison Kafer (Washington, D.C.: Gallaudet University Press, 2010).
24. Thomas Armstrong, *Neurodiversity: Discovering the Extraordinary Gifts of Autism, ADHD, Dyslexia, and Other Brain Differences* (Cambridge, Mass.: Da Capo Press, 2010), 3.
25. Matthew H. Schneps, L. Todd Rose, and Kurt W. Fischer, "Visual Learning and the Brain: Implications for Dyslexia," *Journal of Mind, Brain, and Education* 1, no. 3 (2007).
26. Ibid.
27. Annie Murphy Paul, "The Upside of Dyslexia," *New York Times*, February 4, 2012, http://www.nytimes.com/2012/02/05/opinion/sunday/the-upside-of-dyslexia.html.
28. Hans Asperger, quoted in Joan James, "Singular Scientists," *Journal of the Royal Society of Medicine* 96, no. 1 (January 2003): 36–39.
29. T. Armstrong, *Neurodiversity,* 204.
30. Collette Snowdon, "Casting a Powerful Spell: The Evolution of SMS," in *The Cell Phone Reader: Essays in Social Transformation,* ed. Anandam P. Kavoori and Noah Arceneaux (New York: Lang, 2006), 107–24.
31. "Fifteen Years of Text Messages, a 'Cultural Phenomenon,'" *New York Times,* December 5, 2007.
32. Mara Mills, "Deaf Jam: From Inscription to Reproduction to Information," *Social Text 102* 28, no. 1 (Spring 2010): 35–57. Mills calls deafness an "assistive pretext" to invention, noting that the use of deaf people and deafness was not always directly beneficial to deaf people themselves. This may be so, but it is still apparent that deafness was both a stimulus to invention and a way in which inventions would be refined for general consumption.
33. Bauman and Murray, "Reframing" and "Deaf Studies in the Twenty-First Century."
34. "Deaf Police Monitor Security Cameras," *Mazaltan Messenger,* May 26, 2012, http://mazmessenger.com/2012/05/26/deaf-police-monitor-security-cameras/.
35. "Policías sordomudos vigilan Oaxaca," BBC Mundo, September 6, 2012, http://www.bbc.co.uk/.
36. B. Wilkowski, M. Robinson, and C. Friesen, "Gaze-Triggered Orienting as a Tool of the Belongingness Self-Regulation System," *Psychological Science* 20, no. 4 (April 2009).

37. Beatrice Beebe and Joseph Jaffe, "Dyadic Microanalysis of Mother–Infant Communication Informs Clinical Practice," in *Human Development in the Twenty-First Century: Visionary Ideas from Systems Scientists,* ed. Alan Fogel, Barbara J. King, and Stuart G. Shanker (New York: Cambridge University Press, 2007).
38. Robert Sirvage, "Investigating Signers' Navigational Proxemics" (master's thesis, Gallaudet University, 2009).
39. Megan Matovich, Why Sign? Exploring the Benefits of Sign Language, whysign.com, accessed July 23, 2012.
40. Joseph J. Murray, "Co-equality and Transnational Studies: Understanding Deaf Lives," in *Open Your Eyes: Deaf Studies Talking*, ed. H-Dirksen L. Bauman and Benjamin Bahan (Minneapolis: University of Minnesota Press, 2008), 100–110.
41. Kelly Rogel, e-mail communication with Jean Bergey, July 13, 2012.
42. "Døvstummekongressen i Paris, 1900," *Smaablade for Døvstumme* 9, no. 65 (1900): 1032.
43. For works that look at transnational Deaf communities and interactions, see Jan-Kåre Breivik, *Deaf Identities in the Making* (Washington, D.C.: Gallaudet University Press, 2005); Joseph Murray, "A Touch of Nature Makes the Whole World Kin: The Transnational Lives of Deaf Americans" (doctoral diss., University of Iowa, 2007); Jan-Kåre Breivik, Hilde Haualand, and Per Solvang, "Rome—A Temporary Deaf City! Deaflympics 2001" (Rokkansentret Working Paper 2, Bergen, Norway, 2003); and Joseph Murray, "True Love and Sympathy: The Deaf–Deaf Marriages Debate in Transatlantic Perspective," in *Genetics, Disability, and Deafness*, ed. John Vickrey Van Cleve (Washington, D.C.: Gallaudet University Press, 2004), 42–71.
44. Pierre Desloges, "A Deaf Person's Observations about 'An Elementary Course of Education for the Deaf,'" in *The Deaf Experience: Classics in Language and Education*, ed. Harlan Lane, trans. Franklin Philip (Cambridge, Mass.: Harvard University Press, 1984), 37.
45. Thomas Edison, quoted in Theresa Collins and Lisa Gitelman, *Thomas Edison and Modern America: An Introduction with Documents* (New York: Palgrave Macmillan, 2002), 42.
46. Bruno Kahne, *Deaf Tips: Twelve Lessons from the Deaf World to Improve Your Communication in Your Personal, Social, and Professional Life* (CreateSpace Independent Publishing Platform, 2013).
47. Signed languages have also been developed in many indigenous communities, from the Walpiri in Australia to the Assiniboine tribe in North America. Plains Indian sign language has also been documented. Although these languages may not be as fully developed as native languages of deaf communities, they are nonetheless testimony to the human nature of signed languages. See Adam Kendon, *Sign Languages of Aboriginal Australia: Cultural, Semiotic, and Communicative Perspectives* (Cambridge: Cambridge University Press, 1988); and Brenda Farnell, *Do You See What I Mean? Plains Indian Sign Talk and the Embodiment of Action* (Lincoln: University of Nebraska Press, 2009).
48. It is important to note that individuals throughout history have observed the fully grammatical nature of signed languages, including John Bulwer, *Chirologia; or, The Natural Language of the Hand* (1644); Desloges, "Deaf Person's Observations" (1779); and Auguste Bebian, *Essai sur les sourds-muets et sur le langage natruel* (1817), among others. Nevertheless, the full case for the fully human status of signed languages was not made until William Stokoe's work in the 1960s.
49. William Stokoe, *Language in Hand: Why Sign Came before Speech* (Washington, D.C.: Gallaudet University Press, 1999).
50. H-Dirksen L. Bauman, "Listening to Deaf Studies," introduction to *Open Your Eyes: Deaf Studies Talking*, ed. H-Dirksen L. Bauman (Minneapolis: University of Minnesota Press, 2008).
51. Melissa Malzkuhn, personal communication, July 23, 2012.
52. H-Dirksen L. Bauman, Jennifer Nelson, and Heidi Rose, eds., *Signing the Body Poetic: Essays in American Sign Language Literature* (Berkeley: University of California Press, 2006).

53. See H-Dirksen L. Bauman, Jennifer Nelson, and Heidi Rose, introduction to ibid., 6.
54. H-Dirksen L. Bauman, "Redesigning Literature: The Cinematic Poetics of American Sign Language Poetry," *Sign Language Studies* 4, no. 1 (Fall 2003); and "Getting Out of Line: Toward a Visual and Cinematic Poetics of Sign Language Literature," in Bauman, Nelson, and Rose, *Signing the Body Poetic*.
55. Oliver Sacks, *Seeing Voices* (New York: Vintage, 1990), 90.
56. The film *Gallaudet* can be seen at movie.gallaudet.edu. This film was directed by Ryan Commerson, filmed by Wayne Betts Jr., and produced by H-Dirksen L. Bauman.
57. S. W. Cook, Z. Mitchell, and S. Goldin-Meadow, "Gesture Makes Learning Last," *Cognition* 106 (2008): 1047–58.
58. Frank Wilson, *The Hand: How Its Use Shapes the Brain, Language, and Human Culture* (New York: Vintage, 1998).
59. Marilyn Daniels, "Seeing Language: The Effects over Time of Sign Language on Vocabulary Development in Early Childhood Education," *Child Study Journal* 26 (1996): 193–208; Laura Felzer, "A Multisensory Reading Program That Really Works," *Teaching and Change* 5 (1998): 169–83; Marilyn Daniels, "Happy Hands: The Effects of ASL on Hearing Children's Literacy," *Literacy Research and Instruction* 44 (2004): 86–98.
60. See "Historic Sign Language Films and the Preservation of American Sign Language," a special issue of *Sign Language Studies* 4, no. 3 (Spring 2004).
61. Microsoft has filed a patent to explore the use of ASL with a Kinect device. Microsoft Corporation, gesture keyboarding, US Patent 20,100,199,228, filed February 23, 2009, and issued August 5, 2010. See Tim Goldman, "Patent Shows Kinect Recognizing Sign Language," *Escapist,* August 2010, http://www.escapistmagazine.com/news/view/102637-Patent-Shows-Kinect-Recognizing-Sign-Language.
62. Bauman and Murray, "Deaf Studies in the Twenty-First Century," 210–25.
63. "Human/Need/Desire," *Switched at Birth*, season 2, episode 6, directed by Norman Buckley, ABC Family, aired on February 11, 2013.

I

PHILOSOPHICAL **GAINS**

1

ARMCHAIRS AND STARES

On the Privation of Deafness

TERESA BLANKMEYER BURKE

> Nature has not been as cruel to us as is commonly assumed. . . .
> The privation of hearing makes us more attentive in general.
> —*Pierre Desloges, "A Deaf Person's Observations about 'An Elementary Course of Education for the Deaf'"*

It is a truism that one can lose only what one already possesses. Hearing people unaccustomed to the signing Deaf world are prone to conflation: they confuse what it is like to be a deaf person with what it would be like to *become* deaf. Yet these are different experiences. Becoming deaf, or the loss of hearing, is distinct from a lack of hearing, which is a *privation,* or absence.

As a Deaf philosopher who writes about bioethics and the signing Deaf community, I am often struck by the divide between accounts of what it is to be a Deaf person and what hearing people think it must be like to be a deaf person.[1] This chapter attempts to flag some of these differences between Deaf people's lives and assumptions about those lives, offering ways to think about Deaf people through the lens of Deaf Gain, which I define broadly to include the experiences not just of signing Deaf people but of all deaf and hard-of-hearing people. I begin my analysis of Deaf Gain by suggesting that phenomenological exploration of what it is to be a deaf person is an appropriate strategy. Next, I offer a brief narrative description and analysis of my own phenomenological account—which is, to be sure, but one data point. I then consider how notions of Deaf Gain might be further enriched by other phenomenological experiments and accounts, focusing on the potential Deaf Gain from the intimate nature of the gaze experienced by signing Deaf persons, using two kinds of relationships to illustrate this idea. Following this, I address the question of Deaf Gain in the intimate gaze of nonsigning deaf people through speechreading. At this point, my argument shifts from Deaf Gain to the privation of deafness, with a look at the experience of what it is like to be a person who is not deaf—to be a person who hears. I suggest that the discussion about this experience is impoverished because of the conflation of the auditory sensation of species-typical hearing with the sociocultural experience of being a Hearing

person.[2] I conclude my chapter with a proposal for identifying other loci of Deaf Gain, both instrumental and inherent.

Leaving the Armchair

Philosophical thought often begins in armchairs, but it need not remain there. Sometimes it is useful for philosophers to work out their thoughts through personal experience that goes beyond identifying and reasoning through one's intuitions and actually tests them.[3] In thinking about the benefits of Deaf Gain and about whether they might extend beyond the initial cognitive, creative, and cultural aspects proposed by Dirksen Bauman and Joseph Murray,[4] I recalled the actions of philosopher Tamara Horowitz, who engaged in experiential practices as a means of generating philosophical thought.

The first female chair of the philosophy program at the University of Pittsburgh, Horowitz died in 1999. She left a legacy of several books and papers on metaphysics, semantics, and the logic of decision making, as well as publications marking forays into women's studies and cultural studies. One of the published obituaries referred to a gedankenexperiment that Horowitz conducted as part of her work in feminist philosophy.[5] Philosophers often use thought experiments to test or illuminate a hypothesis, theory, or principle. Rarely do they take thought experiments a step further by putting them into practice. Yet Horowitz decided, as part of her work on the self and identity, to go for a long period of time without looking at her own reflection. This required not only ignoring her reflection in mirrors but also avoiding any glances at plate-glass windows and bodies of still water. Horowitz did this because she wanted to experience the world differently in order to determine what effect it would have on her thoughts, if any. She wondered, as a woman living in a culture where one's physical appearance mattered (as well as one's attention to this appearance), whether the act of avoiding looking at her appearance over time would have an effect on her thoughts. The following paragraphs describe the background to my own philosophical experiment: an incursion into the Hearing world as a Deaf and deaf woman.

When I arrived at Gallaudet University, I decided to focus on keeping my mind as open as possible to the discoveries I would make as a member of the faculty; some of these anticipated discoveries might be cultural, others linguistic in nature, and some even possibly related to identity. I didn't have any expectation about whether or not I would continue to wear my hearing aids. For thirty-five years I had kept to a particular routine. I would wake up, reach for my hearing aids, pop the left one in before stepping out of bed, and hear the world transform from silence into noise.

I was mainstreamed as a child. My first hearing aid was a body hearing aid with a harness to secure the hearing aid while I played. This harness was sufficient to keep my hearing aid in place while I climbed trees and hung upside down on

the monkey bars in my school playground; I did not feel any impediment to my physical activity when playing with my peers. It was only when the play depended on language that this became tricky, and even then, with sufficient speech-reading practice, I managed to adapt to the norms of the Hearing cultural community—not perfectly, but well enough.

Shortly after starting college, I decided to take a sign-language class. This was a course not in American Sign Language (ASL) but in Signing Exact English (SEE), a system of manually coded English that borrowed and modified vocabulary from ASL. Not long after this, I met several Deaf college students and began the process of learning ASL (and suppressing my SEE accent) as well as the mores of the American Deaf cultural community. After a few years I transferred to a college five hundred miles away, and as a result drifted away from the Deaf community for about a decade.

It wasn't until I began graduate school that I reconnected with the Deaf community and renewed my acquaintance with ASL. I used ASL with my Deaf friends and colleagues at school and at the social-services agency for deaf and hard-of-hearing people where I worked. When I was in graduate school classes, I used ASL interpreters to access the spoken-language discussion, but I used my voice to express myself in spoken English. At home I mostly spoke English to my family members but sometimes used ASL with my children, and once in a while spoken Spanish.

Upon moving to my new home in the Washington, D.C., metropolitan area, I lived with a hearing family with only one signing member and worked with a mix of hearing and deaf people who used a variety of approaches to communication, including simultaneous communication with signed and spoken English (SIMCOM), ASL, signed English, spoken English, and spoken Spanish. After one year, I became a faculty in residence and moved into a small apartment located in a campus dormitory. During the workweek, I continued to do as I had always done: I woke up and put on my hearing aids, and then went to work.

In addition to habit, which I think cannot be overlooked in its importance, I believe that there are also cultural reasons attached to my decision to wear hearing aids in an environment where signed language predominates, namely, my experience of partially growing up in an Arab American community, which holds the value of hospitality in high regard, particularly ensuring that the person receiving hospitality feels comfortable—even if this engenders some discomfort upon the person who offers hospitality. The effort I exert and behavior I adopt to accommodate a hearing person who either does not sign or is not fully comfortable with signing are part of what I interpret as an obligation of hospitality. I view the additional work I take on in speechreading and speaking as no more "burdensome" than other actions that would put my guest at ease, and not, as some would characterize it, a matter of forcing the square peg of audiological deafness into the

round hole of Hearing culture. The following section is a narrative account of my at-first-unanticipated and then deliberative expedition into the phenomenology of being a deaf and Deaf woman in both Deaf and Hearing cultural communities.

deaf Excursions into Deaf and Hearing Territory

One weekend well into the academic year, I forgot to put my hearing aids in. I woke up, got my coffee, logged on to my computer, and started working. I realized that I needed a book in my office, so I grabbed my keys and ID card and dashed out the door. Halfway through my walk across what was then a parking lot, I noticed an odd sensation. This was the feeling of a soft breeze in my ear canal. It was remarkably new. Barring times when I removed my hearing aids in order to swim, in thirty-five years I had *never* been outside for an extended period of time without wearing my hearing aids. I felt as exposed as a reluctant first-time nudist without my hearing aids on.

Hearing-aid users know that one of the frustrating limitations of hearing aids is dealing with microphone noise. This can be anything from the rustle of a knit winter cap over a microphone (Polarfleece is quieter than wool) to the wash of background voices in a place where sound bounces off bare walls and floors. For me, wind noise is the equivalent of nails on a chalkboard for hearing people, or the sensation of watching a person sign a presentation in front of a window with tremendous glare. It is viscerally annoying.

So there I was, halfway across the parking lot between Benson Hall and Hall Memorial Building, and I noticed the soft breeze wafting over my ears. The tactile sensation that had always made me hunch my shoulders because it was accompanied by distressing noise was uncoupled from the noise, and it was pleasant. So was the silence. As I walked across the atrium toward the hall, I noticed myself tensing up as a student approached me, greeting me with a rising right palm over his left arm. Not until our exchange began in American Sign Language did I release the tension in my shoulders, recognizing that this was a place where I need not adopt the cultural conventions necessary to fit into the Hearing world.

Living as a hearing-aid user in a Hearing world, I had never considered the advantages of turning off my sound and becoming deaf.[6] I had unquestioningly accepted the argument that wearing hearing aids was necessary for my safety, and I knew that wearing hearing aids provided sufficient supplemental sound for me to speech-read and converse in spoken English with my hearing, nonsigning Hearing family. I also appreciated some sounds for their pleasant qualities, and despised others—sounds that hearing people reported as pleasant—for their annoying tones.

After my realization that Gallaudet University was a psychologically safe place where I could practice life without sound, I began to experiment by deliberately not wearing my hearing aids. In addition to noticing the absence of sound, I also noticed that I changed the way that I interacted with the world. As Pierre Desloges

remarks in the epigraph to this chapter, the privation of hearing made me more attentive and more inclined to reflectiveness. The absence of noise and reduced environmental stimulation were replaced by more attentiveness to my thoughts.

In claiming silence, I had stumbled upon a way to acquire more time doing philosophy. Not having to attend to noises that I could not identify or place freed me up to work. It also provided new ways of thinking about the philosophical questions that had engaged me—questions about being deaf or Deaf (and hearing or Hearing). Could the benefits of silence be part of the Deaf Gain complex? Was the choice to experience the world as Deaf and opting not to speak to Hearing people engaging in justified deceptive activity? Were there other benefits to being Deaf in the world that were qualitatively different from being simply a deaf but culturally Hearing person?

I started going to places without my hearing aids and with a notepad and pen. By gesturing and writing, I learned to take control of communication that was different from what I experienced when I engaged in the Hearing cultural practice of spoken-language communication. Grocery shopping at a local market was less stressful; instead of the cashier becoming angry that I did not hear the announced total sum, the cashier grabbed a pen and wrote it down for me, then signed THANK YOU in ASL and smiled. At the coffee shop, instead of my having to make the choice between waiting with my gaze fixed on the staff or working on my laptop and possibly missing my order when the barista called it out, the barista handed my coffee to his manager, who brought it to me where I was seated.

These are but small victories for Deaf Gain, but the accumulation of the amount of time deaf people spend *not* multitasking is significant, as is the time saved when one's energy is not directed at piecing together spoken communication. This becomes an issue when one is evaluated using the standards of Hearing accomplishment, according to which hearing people have an advantage as multitaskers in a society where communication is at least partly structured around sound. Once my communication ceased to be auditory, the playing field leveled. The enormous effort expended on speech-reading strangers was replaced by equally shared communication responsibilities of written conversation on a notepad.

There are undoubtedly other psychological advantages that privilege Deaf Gain over hearing loss, but the biggest difference I noticed was in how people treated me. If I opted not to speak and indicated my status as a Deaf person by pointing to my ears and writing on a pad of paper, people tended to be helpful. If I wore my hearing aids and indicated my hearing loss through speech, the response this generated was, more often than not, annoyance and impatience. Although this account is anecdotal, one question that it raises is that of how people's biases affect the way they respond to Deaf people and people with hearing loss. Most hearing people have some experience with people with hearing loss—at present, it is estimated that 17 percent of American adults have some degree of hearing loss.[7] This is nothing more than speculation, but it is possible that engaging a

person in auditory mode triggers a negative bias (based on the accumulation of experiences with people with hearing loss) that engaging in a written dialogue does not. Though empirical research will need to be done to verify this possibility, judiciously choosing when to experience life as a Deaf person might be a way to reduce dismissiveness and increase opportunities for respectful, civil interaction in one's daily life encounters.

What Is It Like to Be Deaf and deaf?

I began my exploration into a different variety of deaf experience as a thought experiment to test my intuitions of what it might be like to be a signing and non-speaking Deaf person in mainstream society. For this experiment to be successful, I needed to remove my hearing aids; for the most part, this allowed me to perceive the external world without sound. I could still hear (and feel) very loud noises, such as geothermal drills when I walked past, though I could not locate the direction of the sound. I tried walking near enough to the drills to hear them, closing my eyes, spinning around enough to lose my sense of orientation, pointing in the direction I thought the sound was coming from, and then opening my eyes. This was a very unsophisticated test, but it confirmed what I had suspected: I was not able to use auditory cues in this way.

The reader will recall that a perception of the world without sound when one has once "heard" is loss. In my case, I had no sense of hearing loss, or at least not of the kind that would be experienced by a hearing person. Instead, what I experienced was twofold; through this experience I was finally able to name and identify the dual experiences I had known for all of my life. One was the sense of *hearing* privation from those experiences of not wearing my hearing aids—that is, the lack of knowledge of what it is to hear in a species-typical way. The other was the sense of *deaf* privation from my experiences of wearing my hearing aids—that is, the lack of knowledge of what it is to be deaf. On my account, it seems that being able to decide whether or not one engages in a sensory experience may be as much a benefit as having just one sensory experience. The deaf person who identifies as a member of Hearing and Deaf communities can appeal to Deaf Gain not only in terms of the benefits of being Deaf and being deaf but also through the benefit of choice and control over one's phenomenological sensory experience.

Conceptualizing the world in terms of hearing privation is possible only if one has never heard or has no memories of hearing in the audiological, species-typical sense. Conceptualizing the world in terms of deaf privation is similarly situated; one can know this experience only if one has never been deaf or has no memories of sustained auditory silence, that is, a lack of meaningful auditory input.[8]

The quarterly magazine *Hear the World*, billed as "the Magazine for the Culture of Hearing," celebrates the value of hearing in articles about sound and the experience of hearing. As with the Deaf cultural community, there is much appreciation of art forms based on the community language. *Hear the World* does not lament

the privation of being deaf, just as numerous Deaf magazines do not lament the privation of hearing. The irony of a hard-copy print magazine (that is completely visual) extolling the virtues of sound through pictures of popcorn and articles about running in nature without an iPod or even about intercultural flatulence is no accident; *Hear the World* is a trade magazine supported by the hearing-aid and hearing-systems manufacturing company Phonak.[9] It is aimed at Hearing people, to be sure, but perhaps particularly to Hearing deaf people who were once hearing, reinforcing the notion of loss and removing even the possibility of Deaf Gain.

The philosopher Thomas Nagel has a seminal paper, "What Is It Like to Be a Bat?," that raises this point of phenomenological experience in a slightly different manner. In this paper, Nagel takes a look at the way bats perceive the external world, which is

> primarily by sonar, or echolocation, detecting the reflections, from objects within range, of their own rapid, subtly modulated, high-frequency shrieks. . . . But bat sonar, though clearly a form of perception, is not similar in its operation to any sense that we possess, and there is no reason to support that it is subjectively like anything we can experience or imagine. This appears to create difficulties for the notion of what it is like to be a bat. We must consider whether any method will permit us to extrapolate to the inner life of the bat from our own case, and if not, what alternative methods there may be for understanding the notion. Our own experience provides the basic material for our imagination, whose range is therefore limited.[10]

This is a problem for Deaf Gain. The experience of hearing people in Hearing worlds thwarts the imagination; one cannot know what it is to experience the world of hearing privation unless one has never heard. Now, couple this with the challenge of conceiving one's life as deaf privation. Even if the arguments for Deaf Gain are intellectually accepted (and I am not suggesting that they will not be), the arguments may be resisted by a limited imagination.

In my gedankenexperiment, I initially assumed that the removal of my hearing aids would allow me to experience the Deaf world through hearing deprivation. Once I left the armchair, however, I quickly learned that the separation between hearing privation and deaf privation was blurred; some of my experiences were squarely deaf (but not yet fully Deaf), and others were hearing (but not fully Hearing). Perhaps all phenomenological descriptions of the sociocultural aspects of Deaf Gain are subject to this pitfall and, rather than attending to whether the nature of the deaf experience is more properly described as Deaf or Hearing, the focus should be on the individual's own account of gain and whether it may be generalized.

Descriptions of Deaf Gain as different cognitive abilities are also difficult to sort out in this way. Consider two candidates: Deaf Gain as a different visual-

perception skill, and Deaf Gain as an enhanced ability to focus. Folk wisdom has long maintained that people who lack one of the senses compensate by having highly developed acuity in their other senses. Recent research on vision supports this to some extent, buttressing the claim that deaf people see better, or at least differently, than nondeaf people; not only is this the case for peripheral vision, but also, because of the appropriation of the auditory cortex for this function, the phenomenological quality of this task might be different.[11] Research on touch suggests similar Deaf gains for this sensory experience.[12] It isn't clear whether this difference extends to all deaf people, however, and this raises another question: must Deaf Gain benefits be derived from experiences that are universal or near universal in order to count as Deaf Gain?

The ability of deaf people to focus is a much older argument for Deaf Gain, one that is part of a class of arguments about the benefits of auditory deafness as justification and compensation for purported or real suffering.[13] Historically these arguments appealed to fate or the will of God, though today they are more likely to be couched in contemporary language such as "Everything has a reason." I am somewhat suspicious of the Deaf Gain arguments that take the form of compensation for loss, though I recognize that these may be persuasive to people who find the thought of existing without hearing frightening.

In the better-ability-to-focus as Deaf Gain argument, there are two prongs. One prong is how the argument is received by hearing people, and the other how it is received by deaf people. (Note that I am neglecting the sociolinguistic communities in this account.) Most hearing people are not likely to accept the argument of deaf focus as a call to action; even if they want to improve their ability to focus, they are not likely to choose to become deaf as a way of addressing this goal. The second prong is more interesting, I think, because it also refers to the possession of a trait and, I suspect, the desire to retain that trait no matter the promise or potential of other benefits. So these two prongs have a similar character in the nature of trade-offs, but the variables differ. Deaf people who value their ability to focus, and who have observed hearing people as being easily distracted by noise with some bemusement, may be just as resistant to losing deaf focus as hearing people might be to gaining it.

A final observation about deaf focus as Deaf Gain is the deep connection between focus and the nature of auditory deafness. Vision has a deliberate nature that the sense of hearing lacks (hearing privation again). That is, one can choose to look upon something or to close one's eyes to a sight.[14] One cannot do the same for hearing, unless one is a deaf person who has the ability to turn on or off hearing aids or a cochlear implant (Deaf Gain again). As many a hearing person who has ventured into the library of Gallaudet University can attest, in a Deaf space libraries need not be acoustically quiet for focus to occur. For the deaf person whose life goals and project require a high degree of focus, deaf focus is indeed a Deaf Gain.

Intimacy and Deaf Gain: Challenging Immanuel Kant and Helen Keller

It is oft remarked that "blindness separates you from things, but deafness separates you from people." The origins of this truism are hazy—some attribute the sentiment to Helen Keller and others to Immanuel Kant[15]—yet the point remains that this idea holds only if one considers the experience of the deaf person in a Hearing cultural community. I would like to offer a different perspective in this section, which is that in the signing deaf community, one is not separated from people (or from things, for that matter), and that the nature of signed communication may actually confer an advantage regarding intimacy.[16]

For the purposes of this chapter, intimacy need not be defined too finely. I will consider that intimacy is a state of close relationship between two people that includes assumptions of trust, bonding, mutual caring, and openness. Intimacy is often conveyed through touch and eye contact, two senses foregrounded in the lives of signing Deaf people. The use of a signed language requires eye contact (in the case of sighted people), but all users of signed language engage in touch, given that signs frequently require that signers place one part of their body in contact with another part of their body. I will describe two instances in which vision may offer instrumental reasons for considering Deaf Gain and its relationship to intimacy: the interaction between the signing Deaf person and her interpreter, and the interaction between a Deaf parent and his child.

Consider the interaction between a signing Deaf person and her interpreter. For the purposes of this example, I will focus on an interpreted interaction wherein the signing Deaf person and the signed-language interpreter are strangers and have never met. This is frequently not the case, as local signing Deaf communities may be quite small and interpreters often work with the same people over and over. I will also restrict my example to a short interaction, say, one or two hours, which is the standard minimum billing length. And in this ideal example, assume that the interpreter's skill set is a good fit to the deaf person's needs.

Upon initiating the interaction, the deaf person and the interpreter chat briefly. The nature of the gaze during this conversational interaction is not much different from what might be experienced in an interaction between hearing people using spoken language who are first meeting one another; eye contact is direct and sustained.[17] Once the actual task of interpreting begins, a shift in gaze takes place. The deaf participant using interpreting services is dependent on the interpreter for access to communication; in a visual language, this means that eye contact must be sustained over time. If the eye contact or gaze is broken, vital information may be lost. It is not just a deaf person who must maintain this eye contact; all parties (whether deaf or hearing) who use a signed language must engage in the gaze. Contrast this with a spoken-language conversation between two relative strangers, where eye contact is much reduced.

Working with professional experts, be they physicians, educators, or interpreters, requires a certain degree of trust and in some cases requires that one reveal private information. The experience of interpreting, whether one is the interpreter or the receiver of interpreted signed content, adds the ingredient of the sustained gaze, which is not to be discounted. Signing deaf people and signed-language interpreters negotiate this intimacy all the time—in one-off encounters as well as long-sustained relationships. What can the experiences of the visually oriented signing deaf person teach us about intimacy and trust in encounters with strangers?

By definition, the relationship between parents and their children is intimate. In a world that increasingly redirects the gaze through social media such as Facebook,[18] one question to ask is, What happens to the parent–child gaze in the face of these cultural distractions? Given that intimacy is a factor for psychological health in adult life, the cultivation of intimacy in a world of things that require gaze—an "iPad world"—may be under new pressures. But wait! The hearing child's gaze may attend to her iPad, but she can still split her focus and listen as she is playing. The deaf child is disadvantaged here, because of the need to visually attend to the parent when communicating via a signed language. Although cultural norms and parental strictures can require that the hearing child look at (or gaze upon) the parent during all spoken communication, this is not an option for the hearing child of signing Deaf parents, who *must* look at his parents when communicating with them. This poses a set of interesting questions: Does the deaf child receive a Deaf Gain of intimacy borne and sustained through the gaze because of the requirement for visual communication? Does the hearing child of signing Deaf parents receive a Deaf Gain of intimacy borne and sustained through the gaze because of the requirement for visual communication? What is the scope of Deaf Gain? Is the immediate benefit of Deaf Gain not just for those who are deaf but also for those who are in intimate relationships with deaf people? I take it that one of the objectives of examining benefits of Deaf Gain is to suggest that some of these benefits may accrue to Hearing people through application or knowledge, but my point here about scope is about direct benefit through proximity.

The question here is not whether the mode of signed language is better than that of spoken language but whether the sustained eye contact of signed communication creates or generates more intimacy than spoken language does, and if so, whether this is a Deaf Gain. Psychological research on the connection between eye contact and intimacy suggests that sustained gazing between (nonsigning) strangers can lead to attraction and deep human relationships.[19] Deaf people who communicate with hearing people unaccustomed to the deaf gaze have stories of miscommunication, where one's rapt attention through the gaze is misinterpreted as sexual interest. Because the signing Deaf community is not a hotbed of unrequited love (at least, one surmises, no more so than any other human community),

the experiences of eye gaze and touch are mediated and managed in ways that mitigate this potential for misunderstanding.

The charge of clannishness has long been thrown at the signing Deaf community. Might there be a connection between intimacy and clannishness? Are in-group ties strengthened by communication that requires eye contact? Will this become more important as people retreat into technology? What can we learn about eye contact in communities where it is required by the very nature of the language?

Intimate Stares and Speechreading

The intimacy of the gaze in signed communication is reciprocal. All parties in an exchange must look at one another for communication to take place. This is true for all signed communication, regardless of whether it takes place between hearing individuals, deaf individuals, or a mix of the two. The speech-reading deaf or hard-of-hearing person who does not use a signed language has the same biological imperative as (sighted) signing Deaf people—to rely on her visual abilities during communication interactions—but the exchange is imbalanced, as the hearing person using a spoken language is not required to focus his attention in an equal manner. Whether this asymmetry has an effect on the cognitive processes of the brain is a matter for empirical investigation; whether this speech-reading asymmetry offers any potential Deaf Gain benefits is a different sort of question.

Just what *is* the role of speechreading today? Do people still speech-read? In the age of digital hearing aids and cochlear implants, speechreading classes seem like a quaint artifact from the past, relegated to the shelves of history along with ear trumpets and girdle harnesses for hearing aids.[20] A quick Google search shows this is not the case, however; more than fifty thousand hits are returned for the search term "speechreading classes." Speechreading turns out to have more widespread use than one might think, even in radical signing Deaf communities that eschew all use of spoken communication and its artifacts, including SIM-COM.

So what is speechreading? Part of the answer is that speechreading is the receptive skill component of what has long been known as the "oral method." That is, it involves the comprehension of speech, but not the production. In schools for deaf children that focus on oral methods, often referred to today as auditory-verbal communication, the emphasis on auditory training has deemphasized the need for formal training in speechreading, but this does not mean it doesn't exist. I contend that almost all signing deaf people who interact with talking Hearing people use speechreading, even if it is not named as such.

Consider the following simple example. Suppose you are a deaf person entering a building and you hold the door open for a person exiting the building just after you enter. That person mouths the words "Thank you" as you hold the door open. The social setting plus the context allow you to conclude with a high degree

of confidence that you are being thanked for your action, and you respond with a smile and a nod of your head. But wait a minute, you object, this is not speechreading but a response to a predictable social convention.

Here's another example, and this time the social exchange is limited to signing deaf people. You are returning from a coffee run to your office at a deaf school, and your hands are grasping coffee cups, so you cannot sign. As you walk across campus, your path crosses that of a Deaf colleague, who is pushing a heavy cart uphill and whose hands are also occupied. You greet each other by mouthing "Good morning" and then mouth pleasantries as you pass by each other: "How are you?" "Such cold weather!" and so on. The point that deaf people engage in some kind of speechreading under some conditions is not particularly controversial.

I want to be clear: my attention to how speechreading is used is not suggesting a wholesale return to oralism; likewise, it is not a suggestion to abandon signed communication. It is simply another way of returning to my thesis—suggesting that to best understand Deaf Gain, we need to understand more about deaf people, as well as Deaf people. This means I appeal to empirical researchers to document how deaf people operate and function in the world—not only to examine the great divide between oralism and manual communication but to document how deaf people and signing Deaf people *really* communicate in the world. There is a difference in agenda that I wish to focus on: the move to bilingual and bimodal communication (written English and signed American Sign Language) and away from oralism for the purposes of improving deaf education is one thing; the assumption that these two polar systems reflect distinct deaf or Deaf ways of being in the world is quite another. As I understand it, Deaf Gain is about capturing what deaf people *do* and how this might contribute to human knowledge.

For the purposes of this section, I want to focus on the nonsigning deaf and the hard of hearing, who engage in the practice of speechreading almost every time they interact with another human being. I want to raise the question of what this phenomenological experience of a forced gaze, as it were, might do to a person's understanding of being in the world. Further, I want to suggest that communicating with a constant gaze that is not reciprocal may present interesting implications for Deaf Gain that differ from the experience of signed communication, and that these differences highlight the "deaf" aspect of Deaf Gain in ways that signed communication cannot.

Once referred to as lipreading, speechreading encompasses the ability to comprehend human speech visually. This is not confined to watching mouth movements (hence the change from "lipreading," with its oral fixation) but to watching the entire face and neck as well. Speech-readers also attend to gestures to enhance their comprehension. In addition, speechreading requires other knowledge: knowledge of the spoken language (its grammar, syntax, and vocabulary); knowledge of social context and settings; and knowledge of the speaker's particular way of shaping words and using language, for familiarity with the speaker

(and the topic) increases comprehension. Speechreading is an intense business, and as Terry Galloway notes, it is an intimate business. It is unlike signing, where two participants in conversation take in each other's whole body, watching arm and hand movements in addition to facial grammar, and sometimes doing this through peripheral vision. In the case of speechreading, this is an unpermitted luxury. The speech-reader must look directly upon the speaker's face. The speaker, even if she knows the reason for this action, may attribute other reasons for it (it is flattering, after all, to be the object of undivided attention!), such as flirtation, keen interest in the subject matter (this could be far from the truth), social deference, or perhaps even deep attachment. Again, this is a matter for social scientists to take up.

I'm interested in the speech-reader's experience: When a person's engagement with other people always involves this intense gaze, what does this do to the speech-reader? How does it affect that person's notions of intimacy? What can speech-readers tell us about the interactions between intimacy, eye gaze, and bonding after infancy and outside of close relations such as those with lovers and family members?

One place we might look to for answers to these questions is the research on evolutionary psychology and the role of the gaze between infants and their mothers. There is some suggestion that the intensity of the gaze fosters human bonding; a counterargument to this might be seen in the social bonding of blind children. Now, all sighted children and sighted mothers look upon each other. Being deaf is nothing special in this case. The question is what happens to the gaze as hearing infants begin to acquire spoken language and whether any shifts in gaze as a result of increasing dependence on auditory input contribute to changes in intimate interactions. Do visually dependent infants (and the adults they become) have a different experience of intimacy than hearing infants (and the adults they become)?

Where this gets interesting is in considering what happens when two oral deaf or hard-of-hearing people communicate with each other. How is this interaction similar to Deaf people communicating through sign? How is it different? Much has been made about the absence of an oral deaf or hard-of-hearing culture; I do not want to wade into this debate at the moment, but I will note that oral deaf people and hard-of-hearing people do congregate! Not all of them do, it does not occur every day or even often, and it may change over life stages, but this is also part of the story about how deaf people live. Oral deaf people may attend school together and form lifelong bonds; hard-of-hearing people who become hard of hearing later in life may join organizations such as the Hearing Loss Association of America, meet other hard-of-hearing people who understand this way of being in the world, and bond through that experience—as well as appreciate the relief that comes from not having to explain one's basic requirements for communication. That said, it should not be assumed that one who can describe what is needed

will be equally good at providing it. The lack of an ongoing cohesive oral deaf or hard-of-hearing community may be part of the reason for this.

But what of the question as to whether one ought to consider having a child who may be deaf, for the sake of giving her a leg up on intimacy or any other Deaf Gain? If the aim of Deaf Gain is to offer reasons why there ought to continue to be deaf people in the world, then the arguments that revolve around the intrinsic and instrumental nature of the signing Deaf community are different from those strictly about Deaf Gain for deaf people who do not belong to the Deaf community. Furthermore, the question of whether signing Deaf people wish to have deaf children is different from that of whether Hearing people wish to avoid having deaf children. This difference is not just one of negation but turns on the notion of human flourishing and the capacity to acquire language naturally, as well as to be in a family and community in which a visual language and sociocultural orientation permeate that child's life.

I began this section on intimacy in an attempt to tease out how the physiological and phenomenological experience of being-deaf-in-the-world might provide support to those who wish to counter the CODA objection. According to this objection, given that hearing children of Deaf parents acquire a signed language as their first language and also reap the "benefit" of being hearing in a Hearing world, why would anyone choose to have a deaf child? What is beneficial about being deaf? And finally, how might one justify deliberately bringing a deaf child into the world—that is, by selecting a fertilized egg through preimplantation genetic diagnosis or using genetic screening to choose a mate or a gamete donor who will have the genetic characteristics necessary for ensuring a deaf child? Does the justification for "accidentally" creating a child who is deaf appeal to Deaf Gain in different ways from ensuring a deaf child through the selection of an embryo or a mate? I have written on these questions elsewhere and will not engage them here, except to suggest that the move to eradicate deafness and, by extension, deaf people relies at least in part on the claim that to be deaf confers much more disadvantage than gain. To offer a twist on an earlier point: just as the claim that it is better to be hearing needs an argument, so does the claim that it is worse to be deaf.

Hearing and hearing

Consider the person who has never heard a sound.[21] This person has not lost the capacity for hearing but has simply never experienced what it is like to hear. Now, contrast this with the person who has heard sound over the course of her entire life and who suddenly finds that she is no longer able to do so. In both cases, there is an experience of being audiologically deaf. But in the first case, the person experiences an absence of hearing and knows *only* what it is like to be audiologically deaf, whereas in the second case, the person experiences a loss of hearing and knows what it is like to hear, what it is like to be audiologically deaf, and what it is like to lose one's hearing.

Why is it important to make this distinction? The person who has lived with a particular set of experiences—including the ability to hear sound—upon losing this ability will view her lot in the world as one that differs considerably from what it was before. The capability of hearing is something that is valued at least in part because it is known, whether it is valued for itself or for what it can provide instrumentally. The loss of this known capability presents a different kind of understanding of what it is to be deaf and, I will argue, may be a barrier to understanding the phenomenology of Deaf Gain.

The topic of this chapter is not hearing loss, which has been covered extensively, but an examination and exploration of Deaf Gain. In the previous sections I have embarked on a philosophical journey regarding the types of gain one might experience as a Deaf person; I now want to catalog a few observations about hearing. The first is this: it is frequently assumed that it is a good thing to be hearing, but this claim is rarely argued for.[22]

In asking the question "Why should hearing be valued?," a variety of answers and strategies emerge. Some possible answers to this question center on biology: the ability to hear presumably continues to confer an advantage to survival; if one is able to hear a shouted warning or the rattle of a diamondback rattlesnake, one has more time in which to respond to danger. Another answer involves aesthetics: certain sounds are pleasing, and the capacity to enjoy pleasures of an aural sort is valued. The ease of learning a language is another reason offered in support of why it is a good thing to hear; provided there is sufficient exposure, hearing children are able to pick up spoken language effortlessly.[23] Yet another claim supporting the value of hearing is grounded in a notion of human nature. What we used to call human nature is dressed in new clothing; among other options, today's concepts of what it is to be human deal in species-typical capacities and functions.

Notice that this catalog of reasons for valuing hearing doesn't distinguish between the cultural aspects of what it is to be a hearing person and the biological aspects of being hearing.[24] Notice also the asymmetry between the language used to describe what it is to be a deaf person—that is, a person who has what audiologists describe as hearing loss—and what it is to be a deaf person who uses a signed language as his preferred language and primary means of communication. In the deaf studies literature, this distinction is captured by the use of a lowercase *d* in *deaf* for the audiological description, and an uppercase *D* in *Deaf* for the sociolinguistic cultural community.

Let's extend this convention to the question of what it is to be a hearing person: we can assign the lowercase *h* in *hearing* to designate the audiological state of species-typical hearing and the uppercase *H* in *Hearing* to designate the sociolinguistic and cultural community. In the Deaf cultural community, signing skill often serves as a marker of cultural membership, though this is neither necessary nor sufficient to identify where one is situated on the audiological continuum. A late-deafened adult may strongly exhibit the patterns of a second-language learner,

and a hearing child of Deaf adults will demonstrate fluency as a native user of a signed language. An astute observer may notice other indicators for audiological status: a late-deafened adult dining in a restaurant will not respond to the noise created when a waiter drops a dish, but the hearing person who is a native signer will almost always react with a start. If it is not clear whether someone is hearing or deaf, it is not unusual for people in the Deaf cultural community to inquire about a person's audiological status or for people to offer up an explanation, such as "My parents are deaf" or "I went to an oral deaf school."

In the Hearing cultural community (and I note that the awkwardness of the term calls our attention to how the distinction between biological hearing status and cultural Hearing identity is glossed over), this information is not offered or sought after as a matter of course; a deaf person is viewed by members of the Hearing cultural community as a person with hearing loss. Some Hearing people may ask whether a deaf person knows "sign language," and perhaps, if they are sophisticated, they will inquire specifically about American Sign Language.[25] However, this usually is not a question aimed at obtaining sociolinguistic cultural information, as it is in the Deaf community, but often simply expresses curiosity about a skill that is perceived as exotic and cool—that of making language appear on the hands.

If one asks a Hearing person, "What's good about being hearing?," the question most likely to be understood and answered is the question "What is the benefit of having the biological capacity to hear?" In order to avoid a solely biological response to the question of hearing valuation, one must include other notions in the question, such as "What are the social, linguistic, and cultural benefits to being Hearing?"

One might want to pause here and ask why this is the case. One plausible reason is that the social, linguistic, and cultural value of being Hearing is not generally recognized as distinctly attached to one's status as a person who possesses the biological capacity to hear sound. When Hearing people do think of themselves as Hearing, it often occurs in response to an encounter with people in the signing Deaf community, in other words, when a Hearing person recognizes his or her difference from one who is a member of a sociolinguistic cultural minority, that is, one who is both Deaf and deaf.

Of course, the usefulness of these classifications is somewhat tempered by the complexity of applying them, especially when one considers the variations presented by combinations of Hearing, hearing, Deaf, and deaf. It is somewhat easy to simply separate out people as deaf or hearing or as having Hearing or Deaf cultural mores, but it gets more complicated when the audiological traits do not map neatly onto the sociolinguistic cultural traits. Part of the problem is due to a conflation of terms in both ASL and spoken English. The Deaf community has developed cultural mechanisms to clear up this confusion, but this is not the norm for the Hearing community.

I believe that addressing the phenomenology of what it is like to be deaf and Deaf is different in important respects from what it is like to be deaf and Hearing. In order to do this, the distinction between auditory status and cultural community membership must be made explicit. Without this distinction, it is all too easy to develop confusing accounts of one's experiences. The late-deafened adult has acquired life experiences as a Hearing and hearing person that do not disappear when he becomes deaf, even though he is now (still) culturally Hearing and audiologically deaf. Likewise, a nonsigning deaf person is culturally identified as Hearing but never views herself as a hearing person. Hearing social culture is marked by language use and cultural norms and practices that vary, sometimes markedly, from the Deaf social mainstream. The most notable feature of this variance is highlighted in the difference between signed- and spoken-language modes, including the reliance on visual and tactile senses, but this is not the only difference.[26]

Bauman and Murray consider Deaf Gain as a contrast to hearing loss. Given the use of the uppercase *Deaf*, this might imply that the gains are limited to those of social, linguistic, and cultural acquisition. This is especially fitting when one considers paths to Deaf enculturation. Given that very few deaf children are born to Deaf parents, most deaf children who enter the Deaf community do so after initial exposure to the Hearing world.[27] The age of entrance to the Deaf community varies: some enter as young children attending state residential schools for the deaf, whereas other deaf people, after a childhood spent in the Hearing cultural community, may search out the Deaf cultural community upon reaching adulthood.

Couching Deaf Gain in terms of benefit not only rejects the twin frames of loss and absence but also creates an opening for inverting the states of hearing and deafness. Applying parallel reasoning of privation and loss to the different center made famous by Carol Padden and Tom Humphries generates Deafcentric responses.[28] In this telling, *deprivation* of Deafness, on the one hand, implies that a person was once in a state of being Deaf but has lost this capacity at some point. An example of this might be a person who has acquired a cochlear implant and who resides solely in the Hearing world. *Privation* of deafness, on the other hand, is the lack of one's capacity to be deaf, or the state of existence inhabited by hearing people.

I suggest that in looking to Deaf Gain as a way of framing the value of what it is to be deaf, one must be wary of falling into to the same trap as those queried on the value of hearing. The danger here is not of overlooking social, linguistic, and cultural benefits of being Deaf but of sliding past the behaviors of those who are deaf but reside solely in the Hearing world. There are two reasons for this danger. First, if Deaf Gain is to function effectively as an (ecological?) argument in favor of human diversity, it must capture the full range of diversity, which includes biological as well as cultural characteristics. The second reason is that without the

biological diversity of deafness, the Deaf Gain argument is in danger of collapsing to what I'll call the CODA challenge. Given that hearing children of Deaf adults can acquire a signed language as a first language, how does one defend against the challenge that the cognitive benefits associated with signed-language use and acquisition are *necessarily* predicated on the signed-language-user's auditory status as a deaf or hearing person?

CODA: Rebutting and Rebooting

I suggested in the previous section that to counter the CODA challenge, one must look not only to the social, cultural, and linguistic gains of the signing Deaf community for Deaf Gain but also at those who are deaf and do not sign. The immediate difficulty with doing this is that deaf people who exist primarily in Hearing worlds and who choose to do so have lives that are full of frustration and isolation; their lives are impoverished, devoid of Deaf Gain. Yet the possibility of Deaf Gain is not negated for these individuals. I believe that this chapter offers several ways in which to generate a more comprehensive description of Deaf Gain—a "rebooting" of how to think about the experience of being deaf in the world.

There are many other possibilities for analysis that turn on Deaf Gain practices, behaviors, and traits that I could not consider because of space limitations, but I will offer a partial list here. Deaf Gain may provide us with new ways to consider old problems in ethics, including those of justice. The practice of turning off one's voice as a Deaf Gain mechanism raises questions about deception, expectation, and obligation. Deaf Gain may also suggest new areas for research inquiry that may, in an ironic twist, require the presence of a thriving population of deaf individuals in order to determine what distinguishes these people from deaf people who are struggling. Given recent findings of a correlation between hearing loss in elderly adults and cognitive decline, it may be worth investigating how younger deaf adults manage the cognitive load on working memory in processing speechreading, and whether anything can be gleaned about physiological traits and other mechanisms involved in this management.[29] Finally, the aphorism "Necessity is the mother of invention" might be the slogan of the telecommunications age, given the role of deaf inventors and those who invented as a response to what they saw as a need of deaf people in the use of electrical current (Thomas Edison), the telephone (Alexander Graham Bell), and the Internet (Vinton Cerf). It is likely an overstatement to suggest that these inventions would not exist without deaf people, and I do not want to be viewed as making this claim. I do want to suggest, however, that for these people, the fact of deafness played a role. In the end, that fact of deafness and the existence of deaf people might just be the most powerful claim Deaf Gain has to offer, bringing us full circle from instrumental reasons for Deaf Gain to an intrinsic one: the value of deaf people, full stop.

Notes

I thank Joseph Murray and Dirksen Bauman for getting me to think about this topic by inviting me to participate in the Gallaudet University April 2010 seminar "Difference as Diversity: Emerging Perspectives on Deaf Gain, Disability, and Physical Diversity as an Enhancement of the Human Condition." This chapter is a much-removed descendant of the paper I presented at this seminar, "Standpoints, X-Phi, and Deaf Gain." I'm grateful to Barbara Byers, Carol Erting, Kenny Fries, Lisa Gill, Amanda Gulde, Tanya Gulde, Elizabeth Harman, Elijah Millgram, Judy Mounty-Weinstock, Regina Nuzzo, Margaret Randall, Barbara Stock, Jim Tabery, Kirk VanGilder, and Tanaya Winder for helpful conversation, to the "Difference as Diversity" seminar audience and participants for constructive and helpful feedback, to reviewer Carol Padden for helpful comments, and to the Gallaudet University library staff for going above and beyond the call of duty.

1. I follow the convention of using the uppercase word *Deaf* to refer to the sociolinguistic community of signed-language users and the lowercase *deaf* to refer to the audiological condition of hearing variation typically characterized as hearing loss.
2. In addition to following the convention of using the uppercase *Deaf* and lowercase *deaf* described in note 1, I also use the lowercase word *hearing* to mark the audiological condition and uppercase *Hearing* to mark the sociolinguistic cultural community of spoken-language users.
3. The X-Phi, or experimental-philosophy, movement is one attempt to do just such testing by combining analytic philosophy with cognitive-science methods. More information on the X-Phi movement can be found in Joshua Knobe and Shaun Nichols, "An Experimental Philosophy Manifesto," in *Experimental Philosophy,* ed. Joshua Knobe and Shaun Nichols (Oxford: Oxford University Press, 2007).
4. H-Dirksen L. Bauman and Joseph J. Murray, "Deaf Studies in the Twenty-First Century: Deaf-Gain and the Future of Human Diversity," in *The Oxford Handbook of Deaf Studies, Language, and Education*, ed. Marc Marschark and Patricia Elizabeth Spencer, vol. 2 (Oxford: Oxford University Press, 2010), 210–25.
5. Amy Schmitter, personal and e-mail conversation with the author.
6. The audiological designations for hearing loss are ranked from mild to profound. In my case, I straddle the border between hard of hearing (with my hearing aids) and deaf (without my hearing aids).
7. "Quick Statistics," National Institute on Deafness and Other Communication Disorders, accessed March 7, 2013, http://www.nidcd.nih.gov/health/statistics/Pages/quick.aspx.
8. I want to pause here to note how problematic the language is in this section: the point of reference is the experience of being deaf, yet the descriptions and idioms carry a normative charge of deafness as lack. This embeddedness of the value of hearing in Hearing culture requires further attention, which I will pick up later in this chapter.
9. *Hear the World* (Frankfurt, Germany), no. 12, 2010.
10. Thomas Nagel, "What Is It Like to Be a Bat?" *Philosophical Review* 83 (1974): 435–50.
11. Stephen G. Lomber, M. Alex Meredith, and Andrej Kral, "Cross-Modal Plasticity in Specific Auditory Cortices Underlies Visual Compensations in the Deaf," *Nature Neuroscience* 13, no. 11 (2010): 1421–27, doi:10.1038/nn.2653.
12. "Quick Statistics."
13. An early account of this Deaf Gain can be found in the writings of the medieval nun Teresa de Cartegena in her work *Arboleda de los enfermos* (Grove of the Infirm).
14. I want to note that this observation holds only for sighted people and to acknowledge that for others, such as blind people and those with low vision, this is not the case.
15. Immanuel Kant, *Anthropology from a Pragmatic Point of View,* ed. Robert B. Louden (Cambridge: Cambridge University Press, 2006), 52.

16. The experiences of deaf-blind and low-vision members of the signing deaf community may differ in some significant ways when it comes to intimacy. It is not my intention to disregard these experiences, but I will not discuss them in this chapter.
17. Cultural norms vary, but in a short interaction that includes introductions and small talk, it is fair to assume that there will be eye contact between participants using spoken language.
18. Mariam Thalos, "Why I Am Not a Friend," in *Facebook and Philosophy*, ed. D. E. Wittkower (Chicago: Open Court Press, 2010).
19. H. Fisher, A. Aron, and L. L. Brown, "Romantic Love: An fMRI Study of a Neural Mechanism for Mate Choice," *Journal of Comparative Neurology* 493, no. 1 (Dec 5, 2005): 58–62.
20. "Deafness in Disguise: Concealed Hearing Devices of the Twentieth Century," Washington University School of Medicine, Bernard Becker Medical Library, 2005–9, accessed February 7, 2013, http://beckerexhibits.wustl.edu/did/20thcent/part2.htm.
21. One challenge here is that, contrary to popular belief, the difference between what it is to be hearing and to be deaf is not starkly delineated; most deaf people have some hearing capability. In order to keep this example simple, however, I am going to assume that deaf people have no hearing capability.
22. I do not have an argument for such a claim and do not intend to present anything more than a sketch of what an argument might look like; I wish here merely to note the absence of such arguments and some of the assumptions on which this claim is grounded.
23. Obviously, the same point applies to sighted children who are exposed to a signed language, but recall that the focus of this paragraph is the benefits of hearing, which is why a spoken language is used here.
24. I wish to remain agnostic on how these disciplines are distinguished and classified; the question of whether there is a strict separation between the biological and the social is beyond the scope of this chapter.
25. The analogy here that is often overlooked is asking a person whether he or she knows "speech" or "spoken language." The assumption that there is one "sign language" and the inability to generalize from one's experience of multiple spoken languages that multiple signed languages exist are just two of the many oversights of mainstream Hearing culture.
26. This is another issue beyond the scope of this chapter, but I suggest that expanding this classification of Hearing and hearing to distinguish the biological and the nonbiological social, linguistic, and cultural aspects offers a possible solution to the CODA classification conundrum; for example, hearing children of Deaf adults can be viewed as hearing and Deaf and Hearing (hDH) as contrasted with hearing people of Hearing parents (hH) or even hearing people of deaf parents who are culturally Hearing (hHd).
27. Ross Mitchell et al., "How Many People Use ASL in the United States?" *Sign Language Studies* 6, no. 3 (2006): 306–35.
28. Carol Padden and Tom Humphries, *Deaf in America: Voices from a Culture* (Cambridge, Mass.: Harvard University Press, 1988), 39.
29. Frank R. Lin, "Hearing Loss and Cognition among Older Adults in the United States," *Journal of Gerontology, Series A* 66, no. 10 (2011): 1131–36.

2

IDENTIFYING THE "ABLE" IN A VARI-ABLE WORLD

Two Lessons

JAMES TABERY

The 2008 U.K. Human Fertilisation and Embryology Act (HFEA) demands, "Persons or embryos that are known to have a gene, chromosome or mitochondrian abnormality involving a significant risk that a person with the abnormality will have or develop (a) a serious physical or mental disability, (b) a serious illness, or (c) any other serious medical condition, must not be preferred to those that are not known to have such an abnormality."[1] Although Deafness was not explicitly listed as an abnormality in the bill (in large part because of an outcry from the Deaf community), it was clear that deafness was thought to fall under the act's reach.[2]

HFEA is an instance of essentialist thinking, the idea that there is an essential human nature that allows for distinctions between "normal" and "abnormal." The purpose of this chapter is to challenge essentialist thinking generally, and that found in HFEA specifically. I will draw on research concerning gene–environment interaction to level this challenge. Two lessons can be drawn from this research, which jointly undermine essentialist thinking and policy decisions based on it. Lesson 1: What counts as "normal" is fundamentally sensitive to environmental and temporal context, and so making environmentally blind judgments of "normal" versus "abnormal" is often confused, at best, and downright dangerous for a population, at worst. Lesson 2: Even if we could agree on who or what counts as "normal" and "abnormal," efforts to predict such outcomes from genetic, chromosomal, or mitochondrial information alone can lead to a result exactly the opposite of that which is desired.

I begin by introducing essentialist thinking in order to explicate precisely what makes it so attractive, for it is important to appreciate the sheer scale of the problem. I then turn to the two lessons. First, I utilize the work of philosophers of biology Elliott Sober and David Hull to convey the lesson about environmental and temporal sensitivity, and then I turn to recent talk of a "genetic predisposition to violence" to convey the lesson about getting the exact opposite of the result that is desired. Finally, I consider the broader implications of doing away with essentialist thinking. As we will see, leaving essentialist thinking behind protects

Deaf culture from policies like HFEA and supports concepts like Deaf Gain by deabnormalizing a trait like deafness and people with that trait. But this protection or support does not stop with deafness. What about Huntington's culture or bipolar gain? Proponents of Deaf culture and Deaf Gain must face what I call "the antiessentialist's challenge": the challenge of deciding just how far the deabnormalization goes, the challenge of deciding just how inclusive antiessentialism can and should be.

The Lure of Essentialism

Essentialism is the idea that there is some property or characteristic or quality that all and only members of a particular kind possess. Examples of such kinds could be gold, cats, or humans. The idea here is that all gold or all humans possess some defining property, characteristic, or quality that they and only they possess. In the subsequent sections I will come to refute essentialism, but it will be instructive to begin by spending some time making the case *for* essentialism. It has had a huge impact on the history of science and philosophy, and appreciating that impact is necessary in order to see just how hard it is to defeat essentialist thinking.

Essentialism is an old idea. It can be traced back at least to the ancient Greek thinkers Plato (428/427 BC–348/347 BC) and Aristotle (384 BC–322 BC). Consider the domestic cat. We have all seen many different domestic cats; some are large, some are small; some are black, some are orange with stripes; some will not go near humans, some will not leave your lap. And yet we still commonly group them all together as domestic cats. The essentialist must give an accounting of that grouping and simultaneously explain how that grouping holds in the face of all the observable variations in the group. For Plato, there exists a world of forms where all essential kinds (gold, human, cat, and so on) may be found as a form or an ideal type. The world we see all around us is the world of appearances. Cats are not all identical to this ideal type in the world of appearances, Plato explains in his *Timaeus*, because the original form of the cat is used as a stamp to "stamp out" all the cats in the world of appearances; and, just as no two ink stamps are the same, because of imperfections and variations in the stamping process, so, too, no two cats are the same in the world of appearances, even though they are all representations of that one ideal form of the cat.[3] Thus, Plato accounts for both the essential cat (in the world of forms) and its variations in nature (due to the stamping process). Aristotle departed from his mentor Plato on many accounts, but Aristotle retained and built upon Plato's essentialism. For Aristotle, everything has its essential place in nature, its natural state. Departures from this natural state are deviations from the norm generated by interfering causes.[4] For instance, according to Aristotle, the natural order of the basic elements moving from the center of the universe outward is earth, water, air, fire, ether. So when you lift earth up into the air, it will naturally fall down to get back below air; or when you light a fire, it will naturally go up to get above air. And so with domestic cats. There is

an Aristotelian essence to cats; the variation we see all around us is simply the deviation from this essence due to interfering causes associated with aberrations in the process of reproduction and development. Elliott Sober has referred to this as Aristotle's "natural state model."[5]

Essentialist thinking and its associated natural state model can be traced through much of science and philosophy over the last twenty-five hundred years. For example, preevolutionary theories of biological species treated them as natural kinds with precisely delineated natural places in the cosmos. The medieval great chain of being specified the divine ordering of everything from plants, birds, mammals, and humans to demons, angels, God, and Satan.[6] We need not turn all the way back to the Middle Ages, however, to find essentialism. Adolphe Quetelet (1796–1874), one of the founders of modern statistics, is most well known for identifying the bell curve as a natural phenomenon with statistically important information. The bell curve is now recognized by statisticians as depicting the natural (or "normal") distribution of a given quantitative trait, reflecting the variation of that trait in nature. But for Quetelet, the bell curve reflected a "law of error"; the distribution showed deviation, with the true value of a trait revealed at the peak of the curve. Thus, Quetelet gathered data about many humans not in order to investigate the natural variation exhibited by them but instead to see past the variation and identify "the average man."[7] As one final example, philosopher Michael Thompson develops a theory of "Aristotelian categoricals" and applies it to life-forms, noting that we can employ a field-guide approach to identifying essential natural kinds all around us. A field guide tells us something like "bobcats have four legs"; thus, when we see a bobcat that has only three legs, we recognize it as a defective bobcat. The human life-form is no exception for Thompson; it, too, is apprehensible and subject to essentialist field-guide generalizations.[8]

Such essentialist thinking has not been without its critics. Claude Bernard (1813–1878), father of experimental medicine, famously scolded around the time of Quetelet, "If we collect a man's urine to analyse the average, we get an analysis of a urine which simply does not exist; for urine, when fasting is different from urine during digestion. . . . A startling instance of this kind was invented by a physiologist who took urine from a railroad station urinal where people of all nations passed, and who believed he could thus present analysis of *average* European urine!"[9] Bernard's humor belies an important question: Why is essentialism so alluring? One reason that essentialism is attractive is that it works quite well in certain domains. Take chemistry: the periodic table of the elements conveys an ordering of every known element in the universe. Each element is defined by its atomic number, which reflects the number of protons associated with the element. An element's essence is precisely this atomic number. Gold, for instance, has the atomic number 79. If something has atomic number 79, then it is gold; and if it is gold, then it has atomic number 79. An atomic number of 78 makes something platinum, and mercury has an atomic number of 80. So chemistry's

periodic table nicely represents the essentialist idea of there being a property or characteristic or quality (atomic number, in this case) that all and only members of a particular kind possess.

Another reason that essentialism is so alluring is that it suggests we can find something like a "human atomic number." And if we could find a human atomic number, then its existence would actually do a lot of work for us. That is, in the same way that we can distinguish gold from mercury with the periodic table or distinguish the Aristotelian essence of a cat from deviations with the natural state model, we could distinguish humans from nonhumans and normal humans from abnormal humans. A human atomic number, the thought goes, identifies human nature. With human nature identified, we can distinguish the normal from the abnormal, the average from the deviant, and the functional from the malfunctioning. Philosopher Philippa Foot, working off of Thompson's Aristotelian categoricals, makes precisely this move for humans. According to Foot, immorality is a natural defect in humans or, more specifically, the workings of an improperly functioning will.[10] The HFEA makes precisely this move for humans, too. According to HFEA, there are certain traits that are natural defects in humans, the workings of improperly functioning genes, chromosomes, or mitochondria.

Lesson 1: "Normal" and "Abnormal" Are Environmentally and Temporally Sensitive

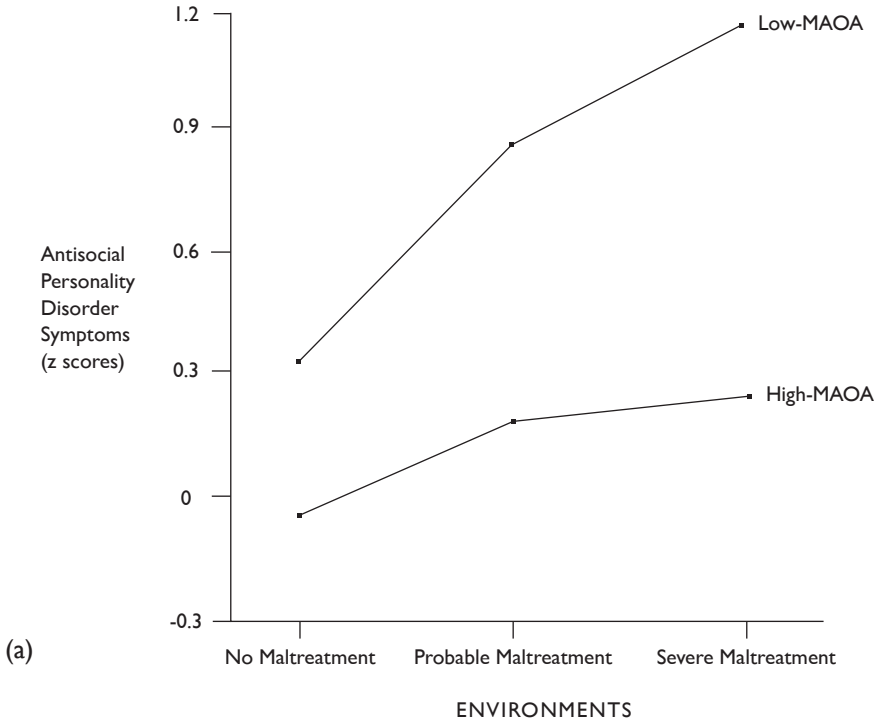
It should now be clear why essentialist thinking is so attractive. It does work well for certain kinds like gold; and were it to work for biological kinds like humans, then this would allow for carving up the world in such a way that normal humans could be distinguished from abnormal humans (and both could be distinguished from nonhumans). Biological reality, however, does not support the existence of a human atomic number. Nor does it support the existence of biological defects, be they of the will or of the gene. I will convey this reality in this section and the next by drawing on research concerning gene–environment interaction. The lesson of this section will be that gene–environment interaction reveals both the environmental and the temporal sensitivity of concepts like "normal," "average," and "functional."

"Gene–environment interaction" refers to cases where different genetic groups respond differently to different environments. Different genetic groups could be groups that are distinguished based on a single-nucleic-acid base pair (a "SNP," or single-nucleotide polymorphism) or groups that are distinguished based on different variants of a particular gene (allelic variants). An array of environments could be something with many values, such as exposure to different levels of childhood maltreatment, or it could be something with only two values, such as exposure (or lack of exposure) to day care. The concept is most easily understood visually with norm-of-reaction graphs such as can be seen in Figures 2.1a and 2.1b. In norm-of-reaction graphs, the different genetic groups are represented separately, with their

phenotypic values in each environment marked with dots and then connected with lines, making phenotypic curves.[11] Each of the two norm-of-reaction graphs in Figures 2.1a and 2.1b represents two different genetic groups distinguished by level of MAOA activity (low versus high). MAOA, or monoamine oxidase A, is a metabolic enzyme that inactivates neurotransmitters in the brain. The array of environments (along the *x* axis) consists in different levels of exposure to childhood maltreatment, such as physical abuse, sexual abuse, and neglect, where "probable" means there is evidence of one indicator of maltreatment in the first decade of life and "severe" means there is evidence of two or more indicators of maltreatment in the first decade of life. And the phenotype that is measured (along the *y* axis) is symptoms of antisocial personality disorder; "antisocial personality disorder" is the clinical term for sociopathy, defined by a pervasive pattern of disregard for and violation of the rights of others, which is associated with violence against others.[12] In Figure 2.1a, a hypothetical norm-of-reaction graph, both genetic groups increase the risk of developing antisocial personality disorder symptoms as exposure to childhood maltreatment increases, but notice that the low-MAOA variant maintains a relatively elevated risk (compared to the high-MAOA variant) across all of the environments.

The important thing to understand about cases of gene–environment interaction is that they come in two forms: those that change in *scale* and those that change in *rank*.[13] Figure 2.1a displays a case of gene–environment interaction that changes in scale. What this means is that the two genetic groups respond differently to the array of environments, but they do so only in the scale of their response. In contrast, Figure 2.1b displays a case of gene–environment interaction that changes in rank. What this means is that the two genetic groups respond so differently to the array of environments that the highest-ranking group in one environment becomes the lowest-ranking group in another environment (hence the "rank" change). The result is a *crossover effect*. In Figure 2.1b, drawn from actual data on the relationship between MAOA, childhood maltreatment, and antisocial personality disorder, notice that the high-MAOA variant increases only slightly in response to increased childhood maltreatment, whereas the low-MAOA variant increases dramatically in response to increased childhood maltreatment.[14] The difference in response is so dramatic that the low-MAOA variant is at higher risk of antisocial behavior in environments with childhood maltreatment, relative to the high-MAOA variant, and at lower risk of antisocial behavior in environments without childhood maltreatment.

Scientists are finding more and more cases of gene–environment interaction that change in rank. Complex human traits such as depression,[15] anxiety,[16] attention-deficit and hyperactivity disorder,[17] IQ,[18] and asthma[19] have all been linked to instances of gene–environment interaction that change in rank. One more detailed example will be instructive: Marian J. Bakermans-Kranenburg and Marinus H. van Ijzendoorn investigated the relationship between variants in the



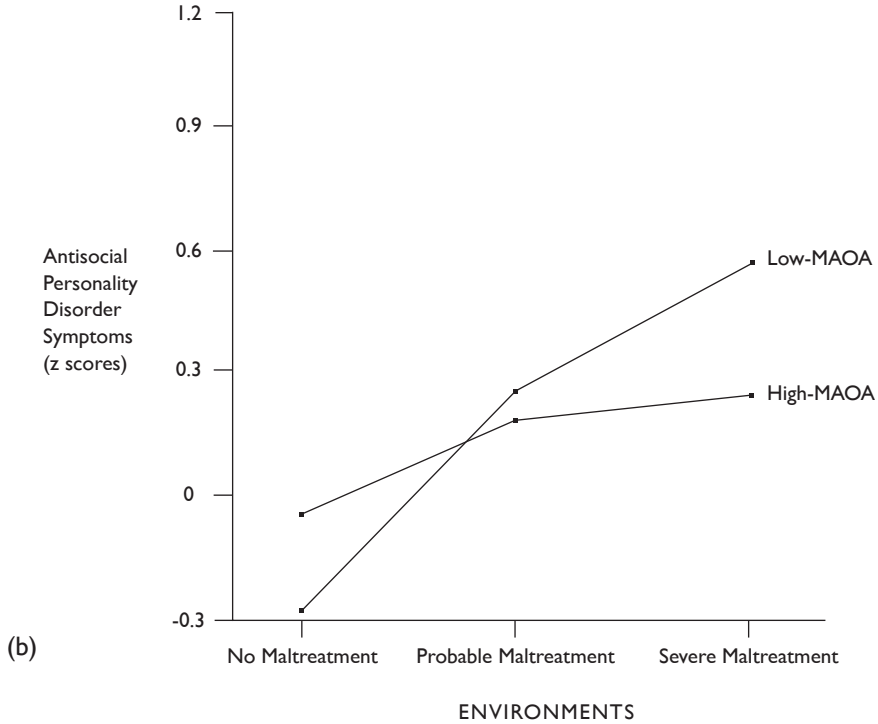


Figure 2.1. Norm-of-reaction graphs for low- vs. high-MAOA activity, exposure to different levels of childhood maltreatment (x axis), and development of antisocial personality disorder symptoms (y axis). (a) Hypothetical norm-of-reaction graph. (b) Norm-of-reaction graph drawn from actual data. Modified from Avshalom Caspi, Joseph McClay, et al., "Role of Genotype in the Cycle of Violence in Maltreated Children," *Science* 297 (2002): Figure 2D.

dopamine D4 receptor polymorphism (DRD4), different parenting styles, and the subsequent development of externalizing or oppositional-defiant behavior.[20] Bakermans-Kranenburg and van Ijzendoorn found the hallmark change in rank; that is, low-sensitivity parenting led to a drastic *increase* in externalizing behavior for the children with the long form of the DRD4 polymorphism while simultaneously leading to a slight *decrease* (albeit not statistically significant) in externalizing for the children with the short form of the DRD4 polymorphism.

These cases of gene–environment interaction that change in rank have important implications for how we can talk about "normal" and "abnormal." Elliott Sober makes this point in his discussion of how modern genetics undercuts the Aristotelian natural state model. A natural-state-model understanding of modern genetics, Sober explains, would assume "there is one path of foetal development which counts as a realization of the organism's natural state, while other developmental results are consequences of unnatural interferences. Put slightly differently, for a given genotype, there is a single phenotype which it can have that is the natural one." But research on gene–environment interaction reveals no such natural state. Sober instructs, "[O]ne finds, instead, the *norm of reaction*, which graphs the different phenotypic results that a genotype can have in different environments."[21]

At the time that Sober was writing his article, there were no known human cases of gene–environment interaction that change in rank. As a result, Sober confined his discussion to the research performed on plants and nonhuman animals that did reveal a change in rank. He considered reaction norms that showed corn plants that grew to different heights in different environments and asked, "Which of these phenotypes is the natural one for the corn plant to have?" The essentialist is stuck here, because "each of the heights indicated in the norm of reaction is as 'natural' as any other, since each happens in nature."[22] Sober's point about plants and nonhuman animals has been borne out for humans as well. We can ask the same question about the norms of reaction in Figure 2.1b: Which of these phenotypes is the *natural* one for the low-MAOA variant? The question is nonsensical. Two very different outcomes arise for the low-MAOA variant, depending on exposure to childhood maltreatment. In short, "natural" is simply that which appears in nature, and what appears in nature is inherently sensitive to environmental context.

David Hull also points to norms of reaction to criticize essentialist thinking, albeit in a slightly different way.[23] Hull writes, "[T]he conviction is sure to remain that in most cases there must be some normal developmental pathway through which most organisms develop or would develop if presented with the appropriate environment, or something. But inherent in the notion of a reaction norm is alternative pathways. Because environments are so variable in both the short and long term, developmental plasticity is absolutely necessary if organisms are to survive to reproduce. Any organism that can fulfill a need in only one way in only a

narrowly proscribed environment is not likely to survive for long."[24] If environments change suddenly for a population, then what was normal or advantageous may suddenly become disadvantageous and abnormal. Again, Hull did not have examples of human cases of gene–environment interaction that change in rank to make his point. But his warning has been borne out. Indeed, biologist Jay Belsky, Marian J. Bakermans-Kranenburg, and Marinus H. van Ijzendoorn suggest that cases of gene–environment interaction that change in rank are evolutionarily adaptive for a population precisely because they allow a population to distribute its bet on reproductive success across a range of environments via a range of genotypes.[25] In general, we think aggression is a bad thing in the twenty-first-century United States of America. But the environment could change quite dramatically (and has changed dramatically at certain points over the course of human evolution), making increased aggression advantageous for the human species.

So: which genetic variants of the DRD4 or the MAOA polymorphisms would HFEA ban parents from selecting? This question should now be recognized as doubly nonsensical. First, it is nonsensical because, as Sober points out, all the variants arise naturally in the population and, thus, all the variants are "natural"; the phenotype obtained by the low-MAOA variant is *environmentally* sensitive. Second, it is nonsensical because, as Hull points out, "normal" and "abnormal" are also *temporally* sensitive, so increased aggression may be abnormal and disadvantageous now but may become advantageous and normal at another time. In my introduction to this chapter, I described lesson 1 this way: "What counts as 'normal' is fundamentally sensitive to environmental and temporal context, and so making environmentally blind judgments of 'normal' versus 'abnormal' is often confused, at best, and downright dangerous for a population, at worst." HFEA is confused, because the essentialist thinking that it employs ignores environmental sensitivity and assumes that there is a natural or normal phenotype for any given genotype. HFEA is also downright dangerous, because the essentialist thinking that it employs ignores temporal sensitivity and assumes that what is advantageous now should be systematically favored by humans making reproductive decisions.

This general biological point against essentialist thinking has also been picked up by philosophers. Chrisoula Andreou criticizes Thompson's Aristotelian categorical theory and Foot's application of this theory to human goodness. In contrast to Foot, who argues that immorality is a natural defect of humans, Andreou points out that different environments may necessitate different human behaviors, and what might count as immoral behavior in one environment (such as increased aggression) could be an entirely moral behavior in another environment.[26]

Lesson 2: "Normal" and "Abnormal" Are Subject to Rank Change

What if we could all just agree on what or who counts as "normal" or "natural" and what or who counts as "abnormal" or "unnatural"? That is, we could grant Sober's and Hull's points about environmental and temporal sensitivity but decide

simply that the relevant environment and the relevant time are this country, right now. We can imagine the HFEA architects responding to the preceding section by replying, "Look, all this talk about different environments and different times is irrelevant. Our job is to make this country at this time a better place to live. It certainly may be the case that three million years from now, in a vastly different environment, the human species will be better off with more aggressive individuals, or better off with asthma, or better off with increased anxiety. But right here, right now, we can agree that aggression, asthma, and anxiety are unwanted and abnormal. As a result, we can distinguish the 'normal' from the 'abnormal' here and now, and restrict parents to choosing an embryo with the 'normal' gene, chromosome, or mitochondrion."

The problem with this reply is that cases of gene–environment interaction that change rank make even this narrowly defined distinction between "normal" and "abnormal" unreliable when actions are taken to bring about the "normal" result. In fact, giving preference to one particular gene or chromosome or mitochondrion can lead to the exact opposite result of the one desired. To appreciate this problem, recall the norms of reaction depicted in Figure 2.1b. The study from which the data in this graph are taken created a major stir in the scientific and bioethical communities. Commentators referred to it as "a watershed event" and "the beginning of a new era."[27] This excitement was generated, first, because it was one of the first real examples of a human case of gene–environment interaction and, second, because Terrie Moffitt and Avshalom Caspi and their colleagues were investigating a fairly controversial phenotype. Antisocial personality disorder correlates highly with violence, and so talk of the low-MAOA group bearing a "genetic predisposition to violence" soon followed on the heels of the study. For example, bioethicists asked questions like "Is there value identifying individual genetic predispositions to violence?"[28] and "Should genetic propensities mitigate punishment for criminal behavior?"[29] Similarly, one author summed up the study as follows: "The Caspi study demonstrates that, in addition to free will, the difference between those who break the cycle of abuse and those who do not turns on the victim's genetic predisposition."[30]

With the results of the MAOA study conceptualized in terms of a "genetic predisposition to violence," bioethicists immediately began raising questions about how this information might be used by parents or the government to target the problems posed by individuals carrying the low-MAOA variant. Jonathan Moreno cautioned, "Prospective parents might therefore test embryos for the MAOA marker before implantation to avoid giving birth to a child with this particular potential for criminality."[31] Likewise, Paul Appelbaum warned, "[T]he pressure to screen is likely to increase if intervention can be shown to actually reduce crime. If effective treatment becomes available, the pressure to identify [at-risk] individuals through screening at birth may be irresistible."[32]

HFEA mandates precisely these warnings. The low-MAOA genotype bears

the "genetic predisposition to violence." As a result, HFEA would prohibit parents from selecting low-MAOA embryos entirely since they are abnormal ones. And remember: the defender of HFEA has already blocked Sober's and Hull's criticisms. With the time and place confined to the here and now, Hull's point about temporal sensitivity and Sober's point about environmental sensitivity have been neutralized. The argument goes like this: increased antisocial behavior may very well be advantageous to the population in some distant future, and the high-MAOA genotype does admittedly have a range of reactions to the various degrees of childhood maltreatment; but if we can all agree that less antisocial behavior is better here and now, then we can also agree to deem the high-MAOA carriers "normal" and the low-MAOA carriers "abnormal."

A closer look at Figure 2.1b, however, should make it clear that the reasoning in the preceding paragraph is highly suspicious. Describing low-MAOA embryos as harboring a "genetic predisposition to violence" fundamentally misconstrues the results of the study, and bioethical analyses or policies based on distinguishing between "normal" high MAOA and "abnormal" low MAOA are equally misguided. The problem, of course, is that the low-MAOA group is at a relatively increased risk of antisocial behavior in environments with childhood maltreatment but simultaneously at a relatively decreased risk of antisocial behavior in environments without childhood maltreatment. The norms of reaction cross over, and so both genetic groups are relatively predisposed to violence, depending on which environment is experienced. Should Moreno's hypothetical parents who test their embryos choose to implant the high-MAOA-carrying embryo, as HFEA would mandate? *Well, only if these parents are already planning on abusing their child.* That is, if the parents have no intention of maltreating their child, then it is actually the low-MAOA embryos that are less likely to develop antisocial behavior.[33]

In my introduction, I described lesson 2 thus: "Even if we could agree on who or what counts as 'normal' and 'abnormal,' efforts to predict such outcomes from genetic, chromosomal, or mitochondrial information alone can lead to a result exactly the opposite of that which is desired." Cases of gene–environment interaction that change in rank make this danger a reality, for "normal" and "abnormal" are subject to rank changes. We may very well agree that less antisocial behavior is better. With the gene, chromosome, or mitochondrion that is at increased risk of antisocial behavior being identified as the "abnormal" group, HFEA demands an answer to the following question: Is the low-MAOA or the high-MAOA the abnormal bearer of increased risk? The speed with which commentators described the low-MAOA group as bearing a genetic predisposition to violence should make it clear which of the two would be prohibited from implantation. Notice, then, what would be the result of that prohibition: parents deciding which embryo to implant would systematically put their children at a relatively increased risk of developing antisocial personality disorder . . . the very opposite of the result that was intended. If there were a true human atomic number, HFEA's

application of essentialist thinking would capture biological reality. Biological reality, however, is much more complex. Ignoring this complexity is a dangerous game indeed.

The Antiessentialist's Challenge: From Deaf Gain and Deaf Culture to Bipolar Gain and Huntington's Culture

The Deaf community has gone to great efforts to deabnormalize deafness. To combat the abnormalizing notion of seclusion due to deafness, we get Deaf *culture*.[34] To combat the abnormalizing characterization of deafness as "hearing loss," we get Deaf *Gain*.[35] The Deaf community emphasizes its unique, rich, and beneficial Deaf culture. The two lessons I have explored in this chapter support these efforts. For instance, the human species could very well find itself at some point in an environment where being Deaf is a decided advantage over being hearing (whether because hearing is a disadvantage or because the extra visual attention associated with being Deaf is an advantage). Furthermore, hearing is no more natural than deafness; they are both found in nature.

These antiessentialist points, however, are not confined to deafness and Deaf culture. In fact, other groups have begun borrowing these moves from the Deaf community. Thomas Armstrong, in his *Neurodiversity*, writes of the "joy of the hyperactive brain," the "advantages of anxiety," and the "positive side of being autistic."[36] The autistic community has begun contrasting autistics with "neurotypicals." And inspirational stories of autistic individuals who have used their autism to great advantage, such as Temple Grandin, raise the very real prospect of "autistic gain."

Let's explore this expansion of deabnormalization a bit further, for it need not stop with the Deaf and autistic communities. It is not difficult to envision a "Huntington's culture."[37] Individuals who test positive for the genetic marker associated with Huntington's disease could unite around a lifestyle that front-loaded exciting and novel experiences early in life, because they would know that the later decades of their lives would be limited by neurodegeneration. Many "nonneurodegenerators" do things like save money for retirement, spend years or even decades in school, and postpone big expenses in exchange for more limited daily pleasures. But those who embraced Huntington's culture would not at all be burdened by this delayed gratification. They could live out the early decades of their lives with a carefree abandon that nonneurodegenerators simply cannot afford. Or what about "bipolar gain"? Individuals who suffer from the depressive episodes associated with bipolar disorder also experience manic episodes that can include little need for sleep, noticeably elevated mood, and inflated self-esteem. Many famous artists, comedians, musicians, and writers have been (or likely would have been) diagnosed with bipolar disorder, and it is unlikely that their unique artistic, comedic, musical, and written achievements would have arisen were it not for the symptoms of bipolar disorder that they experienced.

The Deaf community battled HFEA because it abnormalized Deafness and prevented Deaf parents from selecting embryos that were likely to develop Deafness. But consider two parents, both diagnosed with bipolar disorder, who are undergoing in vitro fertilization and seek to implant an embryo most likely to develop bipolar disorder. (There are no known genetic determinants of bipolar disorder, but candidate genes have been identified.) The parents personally understand the costs associated with bipolar disorder but deem their lives better off with it in light of the achievements that they have realized. They want children who will experience life as they know it, in all its highs and lows. Will members of the Deaf community welcome this company? Or what about two parents, both diagnosed with Huntington's disease, who are undergoing in vitro fertilization and seek to implant an embryo that carries the gene for Huntington's disease. The parents personally understand the costs associated with Huntington's disease but appreciate the Huntington's culture that the disease opens up to them. They want children who will have access to that same culture. Will members of the Deaf community welcome this company?

This is the antiessentialist's challenge: the challenge of deciding just how far deabnormalization goes, the challenge of deciding just how inclusive antiessentialism can and should be. Doing away with essentialism undermines HFEA's distinction between "normal" and "abnormal," and so deafness cannot be selected against simply for being "abnormal." But the same goes for asthma, antisocial behavior, aggressiveness, autism, Huntington's disease, and bipolar disorder.

There are two options here in the face of the antiessentialist's challenge: the Deaf community could welcome these additions to their ranks of the previously abnormalized and fight a common battle; or the Deaf community could make a case for why they deserve to be treated and conceived of differently from, say, those with bipolar disorder or those with Huntington's disease. The danger of this latter approach is that it would likely take the form of an appeal that bipolar disorder is a clinical "disorder" and Huntington's disease a deadly "disease." But distinguishing deafness from a "disorder" or a "disease" is an approach on no firmer ground than distinguishing the hearing from the "abnormally" deaf, because such a distinction falls back on the essentialism that the Deaf community so forcefully combats. It is inconsistent to be antiessentialist about deafness but essentialist about bipolar disorder and Huntington's disease.

As a result, my recommendation is to embrace the common battle. The Deaf community has historically stood at the forefront of the antiessentialist cause, and its successes have in turn excited other antiessentialist fights—for neurodiversity, as one example. These efforts present a general assault on the dominance of the "normalcy" paradigm. To begin drawing essentialist distinctions within the antiessentialist cause can only undermine that assault.

Notes

1. Human Fertilisation and Embryology Act, 2008, c. 22 (Eng.).
2. Steven D. Emery, Anna Middleton, and Graham H. Turner, "Whose Deaf Genes Are They Anyway? The Deaf Community's Challenge to Legislation on Embryo Selection," *Sign Language Studies* 10 (2010): 155.
3. Plato, *Timaeus*, trans. Donald J. Zeyl (Indianapolis: Hackett, 2000).
4. Aristotle, *Physics* (Oxford: Clarendon, 1936).
5. Elliott Sober, "Evolution, Population Thinking, and Essentialism," *Philosophy of Science* 47 (1980): 350.
6. Arthur O. Lovejoy, *The Great Chain of Being: A Study of the History of an Idea* (Cambridge, Mass.: Harvard University Press, 1936).
7. Ian Hacking, *The Taming of Chance* (Cambridge: Cambridge University Press, 1990).
8. Michael Thompson, *Life and Action: Elementary Structures of Practice and Practical Thought* (Cambridge, Mass.: Harvard University Press, 2008).
9. Claude Bernard, *An Introduction to the Study of Experimental Medicine* (New York: Dover, 1957).
10. Philippa Foot, *Natural Goodness* (Oxford: Oxford University Press, 2001).
11. Sahotra Sarkar, "From the Reaktionsnorm to the Adaptive Norm: The Norm of Reaction, 1909–1960," *Biology and Philosophy* 14 (1999): 235; James Tabery and Paul E. Griffiths, "Historical and Philosophical Perspectives on Behavioral Genetics and Developmental Science," in *Handbook of Developmental Science, Behavior, and Genetics*, ed. by Kathryn E. Hood et al. (Malden, Mass.: Wiley-Blackwell, 2010), 41.
12. American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders: DSM-IV-TR* (Washington, D.C.: American Psychiatric Association, 2000).
13. Michael Lynch and Bruce Walsh, *Genetics and Analysis of Quantitative Traits* (Sunderland, Mass.: Sinauer Associates, 1997).
14. Avshalom Caspi, Joseph McClay, et al., "Role of Genotype in the Cycle of Violence in Maltreated Children," *Science* 297 (2002): 851.
15. Avshalom Caspi, Karen Sugden, et al., "Influence of Life Stress on Depression: Moderation by a Polymorphism in the 5-HTT Gene," *Science* 301 (2003): 386.
16. Kathleen Gunthert et al., "Serotonin Transporter Gene Polymorphism (5-HTLLPR) and Anxiety Reactivity in Daily Life: A Daily Process Approach to Gene–Environment Interaction," *Psychosomatic Medicine* 69 (2007): 762.
17. Wolfgang Retz et al., "A Functional Serotonin Transporter Promoter Gene Polymorphism Increases ADHD Symptoms in Delinquents: Interaction with Adverse Childhood Environment," *Psychiatry Research* 158 (2008): 123.
18. Avshalom Caspi, Benjamin Williams, et al., "Moderation of Breastfeeding Effects on the IQ by Genetic Variation in Fatty Acid Metabolism," *Proceedings of the National Academy of the Sciences* 104 (2007): 18860.
19. Sabine Hoffjan et al., "Gene–Environment Interaction Effects on the Development of Immune Responses in the First Year of Life," *American Journal of Human Genetics* 76 (2005): 696–704.
20. Marian J. Bakermans-Kranenburg and Marinus H. van Ijzendoorn, "Research Review: Genetic Vulnerability or Differential Susceptibility in Child Development: The Case of Attachment," *Journal of Child Psychology and Psychiatry* 48 (2007): 1160.
21. Sober, "Evolution, Population Thinking, and Essentialism," 374.
22. Ibid.
23. David Hull, "On Human Nature," *Proceedings of the Biennial Meeting of the Philosophy of Science Association* (1986): 3.
24. Ibid., 8.

25. Jay Belsky, Marian J. Bakermans-Kranenburg, and Marinus H. van Ijzendoorn, "For Better and For Worse: Differential Susceptibility to Environmental Influences," *Current Directions in Psychological Science* 16 (2007): 300; Jay Belsky and Michael Pluess, "Beyond Diathesis-Stress: Differential Susceptibility to Environmental Influences," *Psychological Bulletin* 135 (2009): 885.
26. Chrisoula Andreou, "Getting On in a Varied World," *Social Theory and Practice* 32 (2006): 61.
27. Robert D. Stone, "The Cloudy Crystal Ball: Genetics, Child Abuse, and the Perils of Predicting Behavior," *Vanderbilt Law Review* 56 (2003): 1557; Erik Parens, "Genetic Differences and Human Identities: On Why Talking about Behavioral Genetics Is Important and Difficult," supplement, *Hastings Center Report* 34 (2004): S1.
28. David Wasserman, "Is There Value in Identifying Individual Genetic Predispositions to Violence?" *Journal of Law, Medicine, and Ethics* 32 (2004): 24.
29. Paul S. Appelbaum, "Behavioral Genetics and the Punishment of Crime," *Psychiatric Services* 56 (2005): 25.
30. Stone, "The Cloudy Crystal Ball," 1562.
31. Jonathan D. Moreno, "Neuroethics: An Agenda for Neuroscience and Society," *Nature Reviews Neuroscience* 4 (2003): 149.
32. Paul Appelbaum, quoted in Mark Moran, "Jury Still Out on Impact of Genes on Trial Verdicts," *Psychiatric News* 41 (2006): 12. See also Ravenish Kumar, "Violence Begets Violence; or Does It? A Brain Enzyme Protects Victims of Childhood Abuse from Becoming Antisocial and Criminal," *Clinical Genetics* 63 (2003): 180.
33. James Tabery, "From a Genetic Predisposition to an *Interactive Predisposition:* Rethinking the Ethical Implications of Screening for Gene–Environment Interactions," *Journal of Medicine and Philosophy* 34 (2009): 27; James Tabery, "Interactive Predispositions," *Philosophy of Science* 76 (2009): 876.
34. H-Dirksen L. Bauman, "Listening to Deaf Studies," introduction to *Open Your Eyes: Deaf Studies Talking*, ed. H-Dirksen L. Bauman (Minneapolis: University of Minnesota Press, 2008), 1.
35. H-Dirksen L. Bauman and Joseph Murray, "Deaf Studies in the Twenty-First Century: 'Deaf-Gain' and the Future of Human Diversity," in *Oxford Handbook of Deaf Studies, Language, and Education*, ed. Marc Marschark and Patricia Elizabeth Spencer (Oxford: Oxford University Press, 2010), 2:210.
36. Thomas Armstrong, *Neurodiversity: Discovering the Extraordinary Gifts of Autism, ADHD, Dyslexia, and Other Brain Differences* (Philadelphia: Da Capo, 2010).
37. I thank James Giordano for first exploring this example with me.

3

THE CASE FOR DEAF LEGAL THEORY THROUGH THE LENS OF DEAF GAIN

ALISON BRYAN AND STEVE EMERY

> I hope that your Lordships will be pleased that the deliberate choice of an embryo that is, for example, likely to be deaf will be prevented by Clause 14.
>
> —*Baroness Ruth Deech, "House of Lords Hansard"*

Baroness Deech made the remark quoted in the epigraph during the Second Reading in the United Kingdom's House of Lords in the passage of what is now the 2008 Human Fertilisation and Embryology Act (HFEA).[1] It is how this act was proposed, consulted upon, and debated that we seek to examine in this chapter; in addition, we want to critically evaluate how the law seeks to frame Deaf people, and ultimately their status within society.

Underneath any lawmaking or legal interpretation lie legal theory and philosophical ideas, the field of study known as jurisprudence. Through the study of legal theory, we can seek to understand the implications law has on people and their lives. The understanding of legal theory is well developed, for example, in respect to feminism. The relationship between law and women, where subordination has been critically evaluated and goes beyond discrimination, examines how the law *perceives* women and *expects them to behave*.[2]

However, little or no evaluation has been carried out around legal theory pertaining to Deaf people. For the purposes of this chapter, we will focus on the law relating to Deaf issues, and we will call this "Deaf jurisprudence." We believe that such an examination is crucial, as law plays a role in Deaf people's subordinate status. Furthermore, we believe that in order for Deaf people's relationship to the law to be reconstructed, Deaf Gain needs to materialize. In respect to legal decision making, Deaf communities do not have their own autonomous space within the larger, hearing-dominated democratic society. Deaf people's perspectives are often not given due consideration.[3] In writing about art and literature and the cause of pain, deaf studies scholar Tom Humphries suggests that "we are bound by our relationship to the other and not free."[4] The same bound relationship that Humphries describes we believe also applies to the legal context.

The majority society has sought to use law to "look after" Deaf people, a

practice that begins with an assumption of vulnerability. For example, through welfare provisions and in the United Kingdom, deaf children are encompassed into "special educational needs" legislation. This categorization is based on the child's having a "learning difficulty."[5] Historically, sometimes the law has sought to curb what Deaf people can do; for example, by instituting the prohibition of driving trucks or forklifts, or of becoming a teacher, depending on the jurisdiction.

There are some exceptions. Deaf people have enjoyed some protection against discrimination. In the most notable example, the recognition of signed languages, Deaf people have been involved with creating law that pertains to them. In addition, there are specific articles of the UN Convention on the Rights of Persons with Disabilities (2006), which the World Federation of the Deaf (WFD) was involved in drafting, that pertain to Deaf people.[6]

As we will demonstrate, the passage of the HFEA caused us to reexamine our relationship with the law. It compels us to question the model of underlying legal theory that frames Deaf people as inhabiting a negative state of being. Moreover, the law stated *what it expects from the behavior of Deaf people*. Normality is manifested in different aspects of society,[7] and we suggest that Section 14(4)(9) is a stark example of how it does so through the legal process. As a consequence, the 2008 act misses a large slice of what Deaf people could contribute toward humanity and toward an understanding of the majority's assumptions.

Readers might ask themselves, what does legal theory have to do with the concept of Deaf Gain? First, Deaf people have something to teach, and they test the wider study of jurisprudence, particularly through the application of intersectionality (which we will address later in the chapter); thus, our existence in itself is a benefit to legal scholars. Second, we will illustrate how the *perception* of Deaf people is crucial when it comes to lawmaking, the idea that Deaf Gain needs to make headway before any significant shift takes place with regard to the status of Deaf people in law.

We will suggest that in campaigning against a particular provision in the HFEA, Deaf activists demonstrated a strong case for *positive* representation of their being in the world, using Deafhood-related terms and concepts. This process required a deep uncovering of the ways in which the law frames the Deaf experience differently. As we will show, the mainstream discourse (via the media, politicians, and legal experts) makes statements about harm and implies that it is better that deaf people do not exist.

The chapter is organized in two parts. First, we will explore and analyze the legislative framework and address some of the key issues of the debate, and second, we will explore the relevance of this case study to the field of jurisprudence. Throughout the chapter, we discuss what the case of the HFEA means for Deaf Gain, particularly through our unique "cost to society" concept, and attempt to lay the foundations for further research and discussion.

U.K. Legislative Framework and Background to Section 14(4)(9) and the "Stop Eugenics" Campaign

The Legislative Framework

For context, we turn our attention to the background of Deech's remarks. The 1990 Human Fertilisation and Embryology Act provided the existing legislative framework in respect to genetics and assisted reproduction; responsibility for interpreting that act fell to the Human Fertilisation and Embryology Authority (the Authority). Discretion lay with the Authority for interpreting legislation, and decisions were decided on a case-by-case basis, but as science advanced, the Authority felt it was left in the position of possibly exceeding its powers, leaving itself open to legal challenge regarding its authority to licence embryo testing.[8] Thus the need for a new act that would regulate the following reproductive issues: human embryos outside of the body, the use of embryos created by mixing human and animal embryos for research, and a ban on sex selection for nonmedical reasons. From a family perspective, the 2008 act allowed that, first, in the case of assisted reproduction for unmarried heterosexual couples, the male partner can state clearly that he intends to be the legal parent of any child who might be born. Second, it gave same-sex couples the same rights to parenthood as heterosexual couples when registering their child's birth. Overall, it was intended to bring the 1990 act up to date with technological developments; in addition, it advanced rights for both feminists and LGBT movements. In law, this approach falls under feminist and queer legal theory, a discipline which, along with critical race theory, we will return to later in this chapter.

The government department charged with bringing the 2008 act to fruition was the Department of Health (DH). Within the parameters of this review, the DH wanted to address the issue of preimplantation genetic diagnosis (PGD) because of the wider uses to which it could potentially be put. The screening for illnesses and diseases such as cancer was only one issue of many; as we mentioned earlier, there were concerns of its use for sex selection, for example. In order to develop a context, background on PGD is necessary.

In vitro fertilization (IVF) involves the creation of live human embryos in vitro, where the female egg is fertilized by the introduction of sperm outside the body. PGD is a "technique to determine genetic defects in embryos created by in vitro fertilisation . . . prior to implantation in a uterus for gestation."[9] Parliament sought to regulate PGD and donors under Section 14 of the HFEA, which it titles "Licences for Treatment." Section 14(4)(1–13) is mainly concerned with banning the selection of an embryo based on sex for nonmedical reasons. Selection of the sex of an embryo to prevent the baby from being born with a serious illness is permitted.

Technological advances in PGD have enabled embryos to be screened for serious "genetic disorders" such as Tay-Sachs disease, and "healthy" embryos can be chosen that could be less predisposed to develop cancer. In addition, eggs and sperm can be screened for being carriers of genetic conditions. Legislation around the selection of embryos or donors with a "serious physical illness" is found in Section 14(4)(9).

The DH consultation in 2005 cited the need to regulate assisted reproduction, and among "commonly expressed concerns," previous media coverage was mentioned: "There has been a well-publicized case in the United States, of a deaf couple who wished to select a deaf donor so that the resulting child would also be deaf, and therefore share more closely the parents' experience of the world. The House of Commons Science and Technology Committee considered this issue and concluded that the desire to select a child who would suffer obvious discomfort or worse was an area needing further debate."[10] Although it was suggested that further debate was needed, the authors are not aware that any debate or discourse that involved Deaf people, leaders, or academic researchers took place. Indeed, the parliamentary Joint Committee charged with collecting evidence during the consultation raised the concern that they "[wished for] a disability group [to be] represented."[11] The lack of evidence from Deaf and disability groups supports the view that no due consideration was given, yet the Department of Health went ahead and proposed revisions to the 1990 act anyway.[12] Had the DH consulted with the Deaf community, it would have recognized that academic research has shown that very few Deaf people would use technology to select a Deaf embryo, either in the United States or the United Kingdom.[13]

Campaign Timeline

At the time of Deech's remarks, Alison Bryan was subscribed to a service that automatically informs subscribers when chosen words are mentioned in Parliament.[14] Three days after Deech made her remarks in Parliament, and more than three years after the parliamentary consultation process had been initiated, Bryan reported the comments on her blog, *Grumpy Old Deafies*.[15] This was the first time Deaf people became aware they were being referred to and were subject to legislation.

Before an act becomes law, a bill passes through different stages in Parliament. During the Second Reading in the House of Lords, Deech had made her remarks in discussing the wording of Section 14(4)(9):

> Persons or embryos that are known to have a gene, chromosome or mitochondrion abnormality involving a significant risk that a person with the abnormality will have or develop—
>
> (a) a serious physical or mental disability,

(b) a serious illness,

(c) any other serious medical condition,

must not be preferred to those that are not known to have such an abnormality.

In other words, for the purposes of assisted reproduction, egg or sperm donors who are genetic carriers of a serious disability or illness cannot be preferred to those who are "healthy."

Moreover, if a couple wishes to undertake a test of IVF embryos before any of them are implanted in the woman's body—to discover whether, for example, they were predisposed toward developing cancer, cystic fibrosis, deafness, or many other conditions—they cannot prefer such embryos over an embryo the Authority would deem "healthy." It is important to emphasize that it is not compulsory for couples to take the test: however, a couple who specifically wanted to ensure their baby was hearing would be in a position to do so, whereas those who specifically wanted to increase their chances of their baby's being deaf would not be allowed such a choice.

For the purposes of the law, one must ask what Parliament might mean by a "serious disability" and whether it includes Deaf people. An explanatory note was included with the original text of the bill: "Clause 14(4) contains a provision that relates to the provisions on embryo testing (see note on clause 11). New sections 13(8) to (11) amend the 1990 Act to make it a condition of a treatment licence that embryos that are known to have an abnormality (including a gender-related abnormality) are not to be preferred to embryos not known to have such an abnormality. The same restriction is also applied to the selection of persons as gamete or embryo donors. *This would prevent similar situations to cases, outside the UK, where positive selection of deaf donors in order deliberately to result in a deaf child have been reported*."[16] Evidence indicates that Deech's comment was probably a response to a 2002 article in the *Washington Post Magazine*, which described American Deaf women Sharon Duchesneau and Candy McCullough's efforts to have a child by the means of assisted reproduction. In an interview, the couple remarked, "A hearing baby would be a blessing. A deaf baby would be a special blessing," and, "[we] wanted to increase our chances of having a baby who is deaf." The author, Liza Mundy, noted, "When they were looking for a donor . . . one thing they knew was that they wanted a deaf donor," yet they "[took] issue with the suggestion that they are 'trying' to have a deaf baby."[17]

This couple exercised choice over donor selection. As the choice was made through assisted means and their attempts were presented as trying to create a Deaf baby, the original article caused a stir. The story was picked up by international media, including the BBC.[18] The media were largely critical of the couple's decision; moreover, they failed to highlight a Deaf perspective and presented the topic using sensationalist headlines.

A comparison with the U.K. media reporting on Section 14(4)(9) is remarkable. Space does not permit us to explore media reporting in depth, but the media appear to have served as an influence in the drafting of Section 14(4)(9).[19] The U.K. media sensationalized the issue by implying that Deaf people were campaigning to create deaf babies, and this argument served as a reference point for legislation. For example, a member of the House of Lords sought reassurance from the government: "I do sincerely hope that there is no truth in this story!"[20] As we have stated, there was little or no direct engagement with Deaf people; as noted by Steven Emery, Anna Middleton, and Graham Turner, "A social or cultural perspective of Deaf people, sign language and Deaf culture was therefore missing from the debate."[21] The drafting of law and the shaping of discourse appear to have taken place through the medium of the popular press, as opposed to fact-finding and consultation.

It was within this context that a group of Deaf people and hearing allies launched a "Stop Eugenics" campaign.[22] The campaign was fascinating in the way it rapidly attracted international support, having been set up and coordinated entirely online. Indeed, it is one of the earliest examples of online transnational Deaf Gain that we are aware of. One of the campaign's first online posts was a three-minute video featuring scores of Deaf people worldwide simply signing the word STOP in their native sign language. Requests to support the campaign were overwhelming; two hundred people signed an open protest letter that was sent to the media; at least one embassy, Ireland, received a letter in protest against the bill; and from as far away as Australia, Deaf people sent in visual montages describing Section 14 (4)(9) as a step toward eugenics. The British Deaf Association acted as a respondent agent in a letter to the House of Lords, calling for the section to be dropped,[23] and a letter was sent to the DH by the World Federation of the Deaf. The campaign received widespread coverage, including national and international radio programs, television broadcasts, newspaper coverage, media blogs, and more than seventy other blog posts and online forums.[24] A debate was held in Cardiff, and a march was held in London.[25] Many of those contributing to the overall discussion were household names in the Deaf community, at least in the United Kingdom.

In March 2008, a meeting was held at the DH with representatives from the Stop Eugenics campaign and the British Deaf Association where a number of concerns were raised. As a direct result of this meeting, the wording of the explanatory note in the bill was modified:

> Section 14(4) contains a provision that relates to the provisions on embryo testing (see note on section 11). New sections 13(8) to (11) amend the 1990 Act to make it a condition of a treatment license that embryos that are known to have an abnormality (including a gender related abnormality) are not to be preferred to embryos not known to have such an abnormality. The same restriction is also applied to the selection of persons as gamete or

> embryo donors. This would prevent assisted reproduction technology being used to select an embryo with a view to increasing the chance of giving birth to a child that had or would develop a serious medical condition or to select a donor to increase the chance of a child having a serious medical condition.[26]

The bill then passed through Parliament, with the wording of Section 14(4)(9) unchanged. The Human Fertilisation and Embryology Act received Royal Assent, becoming law on November 13, 2008.

Where Does the Law Stand in 2014?

Briefly, the Human Fertilisation and Embryology Authority produces a Code of Practice and acts as an independent regulator.[27] The following are some of its interpretations.

Preimplantation Genetic Diagnosis: When considering a new Code of Practice under the Act, the Authority took the view that if a condition had already been granted a license for PGD, then testing for similar conditions would be covered and be subject to Section 14(4)(9) of the HFEA.[28] Old licenses would carry forward; given that a license for "autosomal recessive non-syndromic sensorineural deafness" had been granted in 2001,[29] this license would now cover any testing for deaf genes, which would thus be considered a "serious disability."[30] The current Code of Practice states, "PGD should be considered where there is a significant risk of a serious genetic condition being present in the embryo" and elaborates that "the perception of the level of risk for those seeking treatment will also be an important factor."[31] Where an embryo used is known to have an abnormality (for example, if it is Deaf), then "the welfare of any resulting child . . . should normally have approval from a clinical ethics committee."[32] For example, if the clinic decides to use a Deaf embryo, "it should document the reason for the use of that embryo."[33] Therefore, there is no absolute prohibition, and judgment is at the discretion of the clinic. This raises questions: who sits on an ethics committee, and what is that person's life experience and attitude toward deaf people? These factors can impact how a "child's welfare" is interpreted in the context of "nonexistence."

Donors: In terms of gamete donation, "[t]he DH team said that deaf adults would not be prevented from donating gametes to their family. [Those meeting the DH in March 2008] . . . felt that deaf adults should be able to donate gametes to friends as well."[34] This policy immediately raises the question of who gets to define family and whether the policy constitutes indirect discrimination. The DH in later communication stated, "If a donor with a genetic abnormality was being selected because there was no other suitable donor, the Bill would not prohibit such a choice. This would be subject to other professional [and legal] guidance."[35] *A clinic is also classed as a "service provider" for those seeking treatment, and thus is subject to the 2010 Equality Act.*[36] Conditions placed on a pool of donors "could

give rise to discrimination."[37] Thus, the clinic should judge whether "this will result in less favourable treatment because of a protected characteristic"[38]—that is, whether it will reduce the choice of donors for a particular person by virtue of a protected characteristic.[39] It could be argued that Deaf people might draw on donors from the Deaf community (where their friends and network are), and placing any restriction on this would reduce donor availability. Therefore, it could amount to discrimination.

Despite referring to the Equality Act and the potential implications of limiting a pool of donors, the code does not make further reference to discrimination. For example, there is no reference that antidiscrimination legislation would extend to the *type* of donor who is known to carry an "abnormal" trait (for example, a deaf gene). The wording of the code suggests it would be legal to discriminate where a sufficient pool of donors exist who are "healthy." The code strengthens its potential discriminatory nature by going on to state that "[when a] donor [is] known to have an abnormality," then the donor "should be subject to consideration of the welfare of any resulting child and should normally have approval from a clinical ethics committee."[40] If such a donor is used, then the clinic "should document the reason for the use of that donor."[41] However, if "a recipient or any child born as a result of treatment using the donor's gametes is likely to experience serious physical, psychological or medical harm," then a prospective donor should "not be accepted."[42]

There are a number of issues around how the code has been drafted, which is outside the scope of this chapter. The Progress Educational Trust has reflected a number of our concerns.[43] However, it should be noted that Deaf people have not been consulted in respect to revisions; this underlines how Deaf people are often excluded from public life and participation in shaping law and policy, which results in hearing-subjectiveness.

Donors, as people, are obviously afforded rights pertaining to human rights legislation. Whether human rights extend to the question of who can be a donor has been considered by the European Court of Human Rights.[44] The court was asked to consider whether a member state was in breach of the European Convention of Human Rights by imposing restrictions around gamete donation for in vitro fertilization. The court specifically considered whether there was a breach of private and family life (Article 8) and the prohibition of discrimination (Article 14): "[T]he Court observed that there was today a clear trend in the legislation . . . towards allowing gamete donation for the purpose of *in vitro* fertilisation. However, that emerging European consensus was not based on settled principles, but it reflected a stage of development within a particularly dynamic field of law and thus did not decisively narrow the margin of appreciation of the State."[45] The court concluded that in restricting who could be a donor outside the family, there had been no violation of human rights.

However, Article 23(1)(c) of the UN Convention of the Rights of Persons with

Disabilities requires each member state (country) to eliminate discrimination to ensure that "persons with disabilities, including children, retain their fertility on an equal basis with others." This leaves open the potential for challenge.

The Department of Health

The DH's impact assessment for the new, 2008 HFEA acknowledged that Section 14(4)(9) was potentially discriminatory: "Only allowing embryo testing to ascertain whether the resulting child would have or develop a medical condition is aimed to prevent use of such technologies for social reasons. The ability to choose a child that does not have a disability, but not choose one that does is a difficult matter from a discriminatory point of view." It then proceeded, however, to state, "This decision has been made by having particular regard to the welfare of the prospective child and its family. The decision made by prospective parents, is also done without doing direct harm to the person, since embryos and foetuses are not accorded with legal rights."[46] There are two issues here. First, the DH introduced the concept of harm, suggesting that the parents' decision does not inflict direct harm on an embryo. It nevertheless implies harm, because it also states that in regard to the selection of a deaf embryo, "The government on balance, believes that this is an inappropriate use of this technology, and would not be an activity which considers fully the welfare of the prospective child."[47] Second, the impact assessment did not consider the issue of donors and as a consequence is incomplete.

The DH frames the argument that to choose an embryo that is already Deaf ignores the future welfare of the prospective child. It also defers legal consideration to a future time, given that the child has yet to exist. Parallel to this argument, the DH dismisses the concept of future discrimination between deaf and hearing embryos, stating that the embryo cannot be afforded legal rights. On the face of it, the legal rationale appears contradictory. Because an "abnormal embryo" would never be given a chance to be chosen and could not exist in another form, then in theory there is never any future existence to consider.

The Response of Deaf Organizations

As Deaf people campaigning against Section 14(4)(9) discovered, the reaction of the media, politicians, social policy makers, and many members of the lay public indicated that choosing a Deaf child is morally impermissible. There are three lines of questioning here: First, what is society, and who has the right to decide? In its simplest form, the viewpoint of the majority is usually taken, but does the majority always know best? Second, who frames understanding within society? In other words, if Deaf people are excluded from the conversation to begin with, can a society's understanding be true? Third, doesn't this argument assume that Deaf people are not desirable, that they are of less value and have less to offer society?

In the United Kingdom, very few organizations for deaf people are Deaf-controlled; most are run by hearing people.[48] Although they are not democratically

mandated by Deaf people to express a view, deaf organizations nevertheless purport to make representations on Deaf people's behalf. Hence, the very first person asked to comment on the HFEA was a spokesperson for Action on Hearing Loss (formerly known as the Royal National Institute for Deaf People), which partly funds developments to "eradicate deafness." In fairness, Action on Hearing Loss, along with the National Deaf Children's Society, did offer some (albeit tentative) challenges to the media perceptions, but it was careful also to stress that it didn't support "genetic selection." This argument was not considered controversial to state, because campaigners were (unsuccessfully) trying to stress that the majority of Deaf people didn't support genetic selection either.[49] The key details of this campaign have been addressed elsewhere,[50] but it was left to the Stop Eugenics campaign to strive hard to understand complex scientific, technical jargon and to get its case across to the Deaf community as well as a largely hostile media.

The situation is perhaps best summed up by the response of UNISON, one of the most powerful and representative trade unions in the United Kingdom, with a strong and active disability group and Deaf caucus. UNISON stated it was unable to support the Stop Eugenics campaign, because "support from those [deaf and disability] organisations doesn't seem to be there."[51]

In fairness, there were genuine attempts to oppose the deficit perception of Deaf people, yet the whole issue was summed up in the idea that although Deaf people should be afforded rights, opportunities, and equality, Section 14(4)(9) sends out the message that they "are better off not being born."[52] The debates regarding the section are a golden opportunity for academics and organizations to challenge the key concept of normalcy and to understand and recognize Deaf people as being part of nature's biological diversity in the way that Luisa Maffi has described in different contexts.[53] Energy and effort were spent defending the reproductive liberty of Deaf people, countering the sensationalist media headlines referred to earlier that Deaf people were campaigning to create deaf babies and addressing that thorny old chestnut "Are Deaf people disabled?" We now, therefore, explore how we can move on from a defensive to an offensive position, one that attempts to fulfill the opportunity to develop a Deaf jurisprudence and Deaf Gain.

Toward a Deaf Jurisprudence and Deaf Gain: Moving On from the 2008 HFEA

As we have illustrated, how the law treats Deaf people is somewhat contradictory, and furthermore, practice can push Deaf existence to the margins of society. We have seen how law lends to the subordinate status of Deaf people, not only in the context of its treatment of Deaf people but also in a wider application of the relationship between law, the state, and its citizens. In this section we will continue examining the law in the hope that it might yield tentative ideas for the development of Deaf Gain.

It is important to state that what we offer here is the basis for developing a model of Deaf jurisprudence; the model is not complete but has the potential for becoming so. The following sections are intended to demonstrate the varying ways in which current underpinnings of law are based on many incomplete assumptions (economics, biology, identity, and so on). We can't begin to develop a model of Deaf jurisprudence unless these are exposed.

The Law and Its Relationship to Deaf People

When voicing an opinion on Deaf people, academics and policy makers often do not understand Deaf people. Jackie Leach Scully has noted, "[A]lthough the dominant society is likely to have spaces for disabled people, its repertoire does not include habitus in which the disabled person can 'effortlessly' play the same game as people with normative embodiments."[54] Nevertheless, as Teresa Blankmeyer Burke has stated, "Scholars who write about the signing Deaf community . . . have an obligation to verify their assumptions and beliefs about what it must be like to be a Deaf person," which "goes to epistemic authority."[55]

Tom Humphries, among others, has recognized that often how Deaf people present themselves to society has not necessarily been the same as how they feel. The presentation of self to hearing society is negotiated and mediated by Deaf individuals and communities. As Humphries notes, "We have had to re-examine everything we say and analyse every word in light of a new idea, how to express our private world without the constraint of others' cultural bias."[56] Joseph Murray offers the concept of coequality: "Deaf people are not foreigners in their own country or solely oppressed minorities within their nation states. The experience of being Deaf encompasses an expectation of participation in a society not tailored to Deaf norms as well as the articulation of a separate space of being Deaf, a space that, at times, transcends national boundaries." Murray proposes that "traditional binaries . . . can be seen not in opposition to one another, but as mutually formative" and that "[c]o-equality presumes a distinct group acculturated to, but not assimilated in, larger society."[57]

Where a group has been excluded from discourse and rules are subsequently made limiting its autonomy, the group in attempting to defend itself will be framed as reactionary. As Paddy Ladd has stated, "[O]ne finds Deaf communities positioned defensively, operating with an almost 'underground' mentality via cultural patterns formed in reaction to that oppression, and with the loss of an overt and positive vision of the Deaf state of being, both in the communities and among most of their leaders."[58] A group's activism, however, can be turned to positive advantage, as we will attempt to highlight later.

Critical legal theory works on the assumption that law expresses the policy goals of the dominant social group. This is not something that has gone unnoticed by Deaf academics. Ladd has quoted Susan Merry, who refers to the dominant group that "not only controls and rules [the subordinate group], but also

endeavours to impose its cultural order on [that group]."[59] The ultimate formal expression of cultural order is found through the mechanism of law. We would argue that although the law affords Deaf people rights and protection, the dominant group enjoys privilege and can use law as a mechanism to impose its supremacy on Deaf people. Society has the tendency to reward deaf people who, perhaps unintentionally, conform to a hearing construct of who we should be.

How the law treats Deaf people has evolved over time, and in more recent times Deaf people have sought to advocate respect and recognition of difference through the recognition in law of sign language in respective jurisdictions.[60] However, the legal roots of the treatment of Deaf people still lie in a state that invokes charity, where a society wishes to do good or to reassure themselves of their moral conscience. The law affords privilege to Deaf people who conform to a hearing construct of who they should be. For example, it legislates for mainstream education and the legal allocation of public funding for medical services that seek to "cure" Deaf people, including cochlear implants.

In the process of challenging Section 14(4)(9), Deaf people have sought to push the parameter of normalcy to get mainstream society to recognize and accept difference, as well as to promote equality.[61] However, Section 14(4)(9) illustrated that where Deaf people or communities do not fit into the stereotype of what society expects them to be, the law denies them legal rights and reminds Deaf people of their subordinate status. This raises the question as to whether law oppresses Deaf people further, rather than providing liberation through antidiscrimination measures (for example, the Equality Act of 2010 or the promotion of sign language through the Convention on the Rights of Persons with Disabilities). Indeed, queer legal theory has contended that "legal rights regulate rather than simply liberate those who are subordinated."[62] Deaf people's relationship with the law is something for future debate.

To analyze our relationship with the law and why Deaf Gain is crucial, we will borrow existing models of analysis from feminist legal theory, which "seeks to analyse the law's effect on women as a class. . . . [It] is formed by the distinctly feminist point of view, a point of view that is shaped by a woman's life experiences. This understanding can come from either living life as a woman and developing critical consciousness about experience or listening carefully to the stories of female experience that come from others. . . . [L]egal scholarship is not feminist unless it is grounded in women's experience."[63] In order to take this analysis, we need not only to accept the concept of difference but also to acknowledge its value.

The Existing Legal Model: Equality

The principle of equal worth is enshrined in English common law as far back as 1898[64] and continues to reflect the principle of equal value.[65] On an international level, various human rights instruments and the concept of nondiscrimination exist to support the exercise of fundamental rights.[66] Some of these instruments

operate on an international regional level[67] and are enshrined in the domestic law of the United Kingdom. From a civil rights stance, countries have sought to make use of nondiscrimination.[68] However, as we have already seen, the concept of nondiscrimination is subject to the test of reasonableness and places limits on participation. Stephen Wilkinson has noted that disability selection "does not or at least does not necessarily, involve failing to value disability and non-disability equally. [Another response] is to cast doubt upon the Equal Value Principle itself."[69]

From a legal-theory perspective, equality is a liberal principle. To date, Deaf people's relationship with the law has largely been about fitting into existing structures; this is the case with antidiscrimination legislation in respect to disability. To borrow from feminist legal theory, those who take a liberal approach are referred to as "assimilationists," as their arguments do not usually challenge standards, rules, or structures but focus on equal access within an existing framework.[70] The application of the HFEA demonstrates the inherent difficulties of liberal equality principles.

Toward an Evolved Legal Model: Recognition and Celebration of Difference

The limitations of the existing legal models' concept of equality have led to us exploring what needs to be done to develop a theory of Deaf jurisprudence. Here we suggest using a legal model as a base from which to evolve toward a model that recognizes and celebrates difference. Science, after all, has evolved in its quest for perfection, and as we have illustrated, where a body deviates from a "normal" range, it is considered "abnormal." Such is the hold of society's regard for science that this attitude is reflected and deeply ingrained in law and policy. For example the World Health Organization (WHO) once defined *impairment* as "any restriction or lack . . . of ability to perform an activity in the manner or within the range considered normal for a human being."[71] Although the WHO definition has subsequently been revised to include disability as "a dynamic interaction" between impairment and the nature of society,[72] the framework is one of deficit. Such a philosophy is subsequently taken at a national level and shapes people's opinions, for example, in the use of the phrase "hearing impaired" in education. The problem with such terminology is that it doesn't celebrate diversity but rather labels Deaf people as inferior or damaged goods.

In the context of campaigning for rights, historically, Deaf people have had to play down any differences, in their quest both to avoid negative labels and to prove their equal status to hearing people. This is the result of conditions best understood through the lens of history, for example, in Deaf people's exclusion from education, lack of economic opportunity, discrimination, and prejudice. Central to this depiction is the construction of deafness from a hearing perspective, which relegates Deaf people to a subordinate status within society. This status is mirrored in law, which usually approaches Deaf people as being in an unnatural state, one which is to be avoided, cured, or provided for in welfare. Even antidiscrimina-

tion legislation uses "impairment" as the basis for protection, which frames difference as a deviation from the norm and something that is not desirable.[73]

The central premise of Section 14(4)(9) relates to the recognition of difference by mainstream society through its attempts to regulate genetics. In doing so, the law has not only discriminated against those seeking to reproduce but also sent a broader message of subordination. It makes a statement that Deaf people are a problem and not desired, rather than challenging us to widen our understanding of what it means to be human.

If Deaf people are to respond to our relationship with the law adequately, then we need to construct what "difference" means to us—not what is imposed upon us. Martha Minow, a legal academic, has attempted to challenge the broader meaning of difference, to move away from the oppressive connotations of not being within the norm,[74] challenging this reference point and conceding that "difference is actively assigned to others by those who hold power to have their perspective or version of events accepted as reality."[75] Minow illustrates the social construction of difference by making reference to a legal case relating to the inclusion of a Deaf child in education and proposing that all the class learn sign language. Here we have an example of how the existence of Deaf people helps advance legal scholarship, to reinforce the point that multiple truths replace one objective truth.[76] In the following section we address three types of difference: biological, identity, and international, before we present our unique perspective on Deaf people's "cost to society."

Biological Difference

A deficiency narrative pertaining to Deaf people is not only well documented but penetrates everyday life. However, this narrative is one-dimensional: resources are largely poured into the narrative of the dominant group, and research has usually been framed as Deaf people's being functionally *deficient* rather than functionally *different*. Taking such an approach limits our understanding of the many different ways a human body evolves, as well as our quest for knowledge. It also skews the truth, thus instigating a potentially harmful act. This dominant biological perspective could, however, be revised by referring to research that seeks an understanding of memory, of the workings of the brain, and of physical construction, looking for how Deaf people's bodies might be at an *advantage*. For example, brain plasticity has been demonstrated, where the redundant auditory cortex is recruited to process vibration[77] and vision, and where visual sensitivity is selectively enhanced as a result.[78] Charlotte Codina and colleagues summarize: "[D]eaf [people] perform better in aspects such as enhanced motion processing, reorienting visual attention, and enhanced detection of fine object or luminance changes in the visual periphery."[79] Further, "Deaf adults have also been found to detect a fine kinetic light stimulus at further peripheral locations than hearing controls."[80] More recent research shows not just that the brain changes but also

that the retina changes in Deaf people, giving them a visual advantage.[81] Other research has found that Deaf sign-language users pick up on body language faster than hearing nonsigners.[82]

Identity Difference

Regulation and discussion around the HFEA has forced us to analyze personhood and parenthood from the premises of genetics. Jennifer Hendricks states that such analysis asserts male bias in treating DNA as "the essence of parenthood" and ignores other biological contributions, including the "physical and emotional functions with the child."[83] At this point, we find it useful to turn to critical race theory, which reminds us that race is not biological and constructs an identity as a key component of race.[84] In other words, we are more than our biological composition. This theory is one that can also be instructive to the development of a Deaf jurisprudence, as we will now examine.

Lennard Harlan Lane and other scholars have strenuously asserted that Deaf people form an ethnic group,[85] and although English law has not considered Deaf people to be an ethnicity, there is scope to consider this possibility. The U.N. Convention on the Prevention and Punishment of the Crime of Genocide defines *genocide* as the "intent to destroy, in whole or *in part*, a national, ethnical, racial or religious group, as such" or "[i]mposing measures intended to prevent births within the group."[86] The concept of indirect discrimination takes into account situations where criteria or practice would disadvantage a certain group of persons. This concept could be taken further by questioning and challenging the concept of the "abnormal" and pursuing the notion of biological diversity in order to advance Deaf Gain, which would challenge the very concepts and contexts used by the law, including existing discourses of equality, nondiscrimination, and reproductive liberty. The concept of normalcy, for example, is a far more recent concept than is recognized, having emerged into the English language only around 1840.[87] Disability studies scholars such as Vic Finkelstein, Bill Hughes, Lennard Davis, and Bill Armer suggest that the development of normalcy and its antonym abnormality was tied to the development of capitalism; that is, it evolved in the context of industrialization, modernity, culture, and social division. These authors may include D/deaf people within their umbrella of disability, but the concept of the linguistic and cultural biodiversity of peoples has a much longer history.[88] Although the term *biodiversity* emerged in the 1990s through serious concerns about the threat of the loss of diversity for the humanities and earth, particularly the loss of indigenous peoples and languages, the term implies that linguistic and cultural biodiversity is an essential part of *humanity*. Given these perspectives from disability studies and biological diversity, and given that there is some leeway within some laws recognizing and protecting Deaf people's languages and human rights, we can begin to see ways in which a Deaf jurisprudence may be devised that incorporates the values of Deaf Gain.

International Deafhood and the "Economics of Deafness"

The first half of this chapter shows the development of legislation in the United Kingdom that appears to have been influenced by the actions of Deaf people in the United States. This case study of the development of the HFEA shows that the mainstream does understand *something* of the global nature of the Deaf community. Although the decision of two deaf American women to maximize their chances of having a deaf child was largely framed in a negative light, there was also an indication, via blogs and nonpartisan journalists, that there is an opportunity for a positive Deaf space to begin to emerge and flourish.

There remain gaps, however, in developing positive concepts of international Deafhood in some disciplines, and one of these is the field of economics. Deafness has been measured by geneticists in terms of its expense to society; in other words, being deaf is expensive. For example, deafness has been estimated as costing "0.2% of national net income . . . about 400 billion Euros annually at European Community Level,"[89] to the equivalent of €87 billion in 2005.[90] Ilmari Pyykkö and colleagues explain what the costs entail in graphic terms: "[T]hese costs could be compared to those incurred in building a motorway five times all the way around the German border."

The subordinate status of Deaf people, be it in society or law, is ultimately a factor in Deaf people's economic status. This reinforces the notion of dependency and privilege, which draws attention to welfare. As Martha Chamallas summarizes, "Feminist scholarship is directed at showing how 'dependency' is a political and ideological concept and not simply a statement about receiving an economic subsidy."[91] Nancy Fraser and Linda Gordon remind us that historically the construct of "dependency" meant subordination, which applied across society. Given that most people were servants, they were subordinate; thus, "the moral/psychological use of the term barely existed."[92] However, the concept has shifted, and Martha Chamallas paraphrases that in modern times "dependency . . . connotes an individual problem, one that 'registers' as moral/psychological, in the sense of 'an individual character trait like lack of willpower or excessive emotional neediness.' "[93] Martha Albertson Fineman has stated, "[W]e all live subsidized lives," and "the fact of subsidy is not remarkable. The question is why we stigmatize some subsidies but not others."[94] For example, "the material advantages of being white have been hidden from view. . . . [T]he features of the welfare state . . . have benefited the middle and upper classes, yet do not render these groups as 'dependent.' " It is beyond the scope of this chapter to analyze the privilege that hearing people enjoy, but the scope for further analysis is open. Such examination serves as a Deaf Gain, because it advocates the appraisal of what normally would be taken for granted as it was hidden from view. Without the reference point of the other, we are unable to understand ourselves.

There are weaknesses in taking an approach that calculates the "expense

deafness incurs to society"; it assumes these costs exist only for the benefit of D/deaf people. For example, captions are provided because of antidiscrimination legislation appertaining to Deaf people, but their benefit transcends that group, benefiting language learners and children learning to read as well. We refute the higher-cost argument by proposing that the cost to society is higher when there are *fewer* Deaf families in existence.

Responsibility and the "Cost to Society" Argument

It is here we arrive at our key argument for how the action over opposition to Section 14(4)(9) can be turned to positive advantage. The ability to see things differently is something that the Western world embraces in the context of entrepreneurship, as it enables innovation. In other words, it contributes to economic wealth—a trait contemporary societies hold in high regard. One of the central arguments around opposition to selecting deaf embryos or increasing the chances of having a deaf child through donors is the argument that doing so demonstrates a lack of responsibility. Reproduction is regarded as a private decision, but one of the arguments mooted, as we saw earlier, is the cost that Deaf people accrue to society.

We propose that the fewer Deaf children of Deaf families who exist, the higher the cost to society. It is already known that the incidence of mental-health distress is higher in deaf children who go to mainstream school or are from hearing families.[95] The need for specialist intervention, usually funded by the state, therefore goes up.

When hearing children learn, they usually take much of their learning from their families as microeconomic units. Society recognizes the importance of family through promotion of family values, including within the law.[96] Without grounded microstructures, children are not exposed to stable environments in which to grow up. This has some bearing on their ability to reach their full potential within society.

Most deaf children, however, are born to hearing families, and the scope to "learn to be Deaf" usually takes the form of horizontal learning, that is, learning from their peers. The definition of family is more fluid than that of traditional models' notion of a social unit defined by kinship. Deaf people act as a reminder of the fluidity of a family unit.

However, horizontal transmission of language is not enough: a younger generation needs to obtain its knowledge from people other than peers. Transmission needs to take place between generations; otherwise the crucial historical element is lost. (Many Deaf people end up in a situation where the wheel needs to be reinvented as each generation passes.)

While some vertical transmission could take place via wider society structures, such as youth clubs, learning is fragmented. Key transmission takes place through Deaf families.

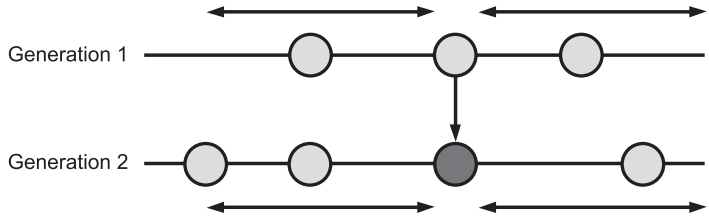


Figure 3.1. Generation 1 represents a typical generation of Deaf people and their families: the middle circle represents Deaf children of Deaf families, or those who have been born into Deaf culture. They are able to pass Deaf language and cultural mores to the second generation (represented by the dark circle in Generation 2).

Deaf children of Deaf parents act as key bolts in holding a community together, transmitting Deaf culture from one generation of Deaf people to the next. Without bolts in any society, a community becomes fragmented and learning diminishes. When building a physical frame, if you remove a bolt, the whole becomes weaker or collapses. The same thing applies to building communities.

Deaf children of hearing parents and people who are deafened after their birth do not learn Deaf culture from their parents. The larger the ratio of deaf people from hearing families to Deaf families, the more thinly horizontal transmission spreads itself and becomes weaker. In other words, a community is more susceptible to fragmentation.

Thus, any argument around the irresponsibility of Deaf parents' choosing a Deaf child because of perceived harm to the child (even though such a child would never exist as a hearing person, given that he or she was deaf at the point of conception) is one-dimensional. It frames consideration on the basis of a perceived impaired body without taking into account other factors. Ignoring the value of these "bolts" and imposing measures that promote their extinction are not only irresponsible acts toward future societies but a form of genocide. It is on this basis that arguments against the selection of Deaf embryos or indeed Deaf donors are framed, and such arguments have little or no regard for a bigger picture.

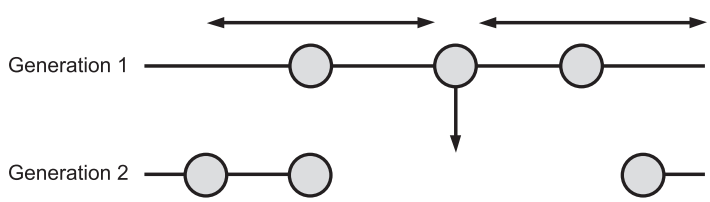


Figure 3.2. A disruption occurs in cultural transmission from the first generation to the second: Deaf people continue to exist, as indicated by the last circle of the Generation 2, but they have to reinvent the wheel all over again.

Essentialism and the Deaf Dimension to the Intersectionality of Legal Theory

Before concluding, we want to address one further example of intersectionality with feminist theory. When attempting to formulate a strategy to challenge Section 14(4)(9), several private e-mail discussions took place between disability activists, the Stop Eugenics campaign, and other parties.[97] Campaigners encountered feminist perspectives over reproduction, particularly in the context of PGD and the screening out of embryos. Some campaigners view these practices as discriminatory toward Deaf people. Moreover, this concern was weighed along with curbing a woman's right to choose. The campaigners reached the conclusion that if choice was to be offered, then it needed to be offered for both screening in and out for PGD, in other words, to screen for a trait or to disregard it. However, it is worth noting that what campaigners were encountering were essentially *hearing* feminist perspectives, the narratives of the dominant group.

What it means to be a woman cannot be understood only through the perspective of the most privileged, because that gives a false universalism.[98] The use of implicit norms further oppresses women of minority groups.[99] Essentialism assumes there is an underlying attribute for all women independent of other factors, including race and class; however, women carry multiple identities, which call for intersectional analysis, a strand of third-wave feminism.[100] With regard to Section 14(4)(9) of the HFEA, the Deaf woman (whose community has historically been subjected to forced sterilization) was not part of the frame of reference when it came to feminist perspectives. That is not to suggest that a Deaf woman would not want choice; rather, here we are highlighting assumptions as to who a woman might be.

In the context of choice, activists also encountered what Katharine Bartlett has labeled "gender imperialism," a concern that disability activists aired privately to the "Stop Eugenics" campaign. Bartlett has suggested that "feminists give too much primacy to sex as a basis of discrimination and too little to other forms of oppression."[101] As science progresses, these clashes of interests will need further analysis, and neither field can move forward without due regard to the other. Intersectional analysis is imperative, as it becomes an essential element of social justice. Wider society benefits, and the Deaf Gain element is that intersectional analysis affords new perspectives on what it means to be a woman.

Conclusion

This chapter on the HFEA has suggested that although the campaign against Section 14(4)(9) received extensive negative media coverage and caused politicians and the public to express and react with fear and rage at what they mistakenly perceived as a modern-day "Frankenstein movement," there has also been the emergence of a theory of Deaf Gain and it has caused us to re-examine our relationship

with the law. This chapter exposes serious flaws and contradictions in the arguments used by the media, politicians, academics, and others for and against Section 14(4)(9). The government's legislation champions equality and stresses the importance of consulting with those most affected by change. It purports to promote values such as not harming others, acting to promote the best possible quality of life, and giving due regard to minorities. In practice, at the very least, the case of the HFEA demonstrates the way such minorities are really treated in law. Through a Deaf lens, it is an ideology that privileges hearing people.

What we have outlined in this chapter are the different ways in which current underpinnings of law are based on many incomplete assumptions. We have sought to expose these assumptions, suggesting that it is necessary to do so as a first step toward developing a model of Deaf jurisprudence. We have drawn upon writings within feminist, queer, and black legal theory to demonstrate how an intersectional perspective can work toward developing a legal theory of Deaf Gain, as well as to provide an insight into these theories. Furthermore, the experience of the HFEA illustrates that law is based on morality and, moreover, the perception of the majority. As we have demonstrated, most notably in the first section of the chapter, there is a meta-problem in that ethics is already hardwired into our institutions, and that makes it difficult to discuss alternatives or narratives. Although we accept that arguing legal principles is vital, it goes only so far, and there needs to be a fundamental shift in attitude that encompasses "Deaf" not as a state of harm but as a state of being that contributes positively to human diversity. We have suggested frameworks for how this might be achieved by the building of a Deaf jurisprudence based on principles of Deaf Gain. This can be accomplished by considering Deaf people within a wider framework of linguistic biological diversity, where being Deaf is neither better nor worse than being hearing; it is just different.

Notes

1. Human Fertilisation and Embryology Act, 2008, c. 22 (Eng.).
2. For example, see Martha Chamallas, *Introduction to Feminist Legal Theory* (New York: Aspen, 2012).
3. Paddy Ladd, *Understanding Deaf Culture: In Search of Deafhood* (Clevedon, UK: Multilingual Matters, 2003); Steven D. Emery, *Citizenship and the Deaf Community* (Nijmegen, Neth.: Ishara, 2011); H-Dirksen L. Bauman, ed., *Open Your Eyes: Deaf Studies Talking* (Minneapolis: University of Minnesota Press, 2008).
4. Tom Humphries, "Talking Culture and Culture Talking," in Bauman, *Open Your Eyes*, 40.
5. Education Act, 1996, s. 312 (Eng.).
6. Sign language is expressly mentioned in Articles 2, 9, 21, 24, and 30, which required negotiation on WFD's part. For example, Article 2 did not follow WFD's wishes, arguing that communication modes are not the same as languages. In addition, it was difficult to get Article 21(e) included: after the sixth meeting, only nine states supported it; the seventh ad hoc meeting approved it, with one country requesting removal on the eighth meeting. After further negotiation with WFD, 21(e) remained in the convention. See Joseph J. Murray, "The Convention on the Rights of Persons with Disabilities (CRPD) and Deaf Academics"

(keynote presentation at 4th International Deaf Academics and Researchers Conference, Dublin, Ireland, 2008).

7. Lennard J. Davis, "Constructing Normalcy," in *The Disability Studies Reader,* ed. Lennard J. Davis, 3rd ed. (New York: Routledge, 2010), 3–19.
8. U.K. Department of Health, letter to the Equality and Human Rights Commission, June 2, 2008.
9. Bonnie Steinbock, "Preimplantation Genetic Diagnosis and Embryo Selection," in *A Companion to Genethics,* ed. John Harris and Justine Burley (Oxford: Blackwell, 2002), 175.
10. U.K. Department of Health, "Review of the Human Fertilisation and Embryology Act: Proposals for Revised Legislation (Including Establishment of the Regulatory Authority for Tissue and Embryos)," Her Majesty's Stationery Office, December 2006, 40.
11. When the U.K. government wishes to introduce a new law, it produces a "green paper," a tentative report that seeks out opinion on policy direction and broadly indicates the government's intention. The subsequent "white paper," containing more detailed proposals, is consulted on and presented before Parliament. See Joint Committee on the Human Tissue and Embryos (Draft) Bill, First Report, Appendix 5, in Vol. 2, HC 630-II, HL Paper 169-II, published August 8, 2007, accessed at http://www.publications.parliament.uk. The quotation is from Andrea Minichiello Williams, public policy director of the Lawyers Christian Fellowship, who went on to state, "Even with society's checks and balances there were dangers. Society did not live with Down's Syndrome or Williams Syndrome in a way that it once did. This raised serious questions about the way human dignity is perceived, how we care for vulnerable people and how we perceive them."
12. Joint Committee on the Human Tissue and Embryos (Draft) Bill, First Report, in Vol. 1, HC 630-I, HL Paper 169-I, and Vol. 2, HC 630-II, published July 24, 2007; and HL Paper 169-II, published August 8, 2007, accessed at http://www.publications.parliament.uk.
13. For the United States, see Julian Savaleseu and Guy Kahane, "The Moral Obligation to Create Children with the Best Chance of the Best Life," *Bioethics* 23, no. 5 (2009): 284, citing a survey in S. Baruch, D. Kaufman, and K. L. Hudson, "Genetic Testing of Embryos: Practices and Perspectives of US IVF Clinics," *Fertil Steril* 89 (2008): 1053–58n6. For the United Kingdom, see Anna Middleton, Jenny Hewison, and Robert F. Mueller, "Prenatal Diagnosis for Inherited Deafness: What Is the Potential Demand?" *Journal of Genetic Counseling* 10, no. 2 (2001): 121–31.
14. This service is MySociety's "They Work for You," http://www.theyworkforyou.com/.
15. Alison Bryan, "Parliament: Deaf Embryo Selection to Be Made Illegal," *Grumpy Old Deafies*, November 22, 2007, http://www.grumpyoldeafies.com.
16. Human Fertilisation and Embryology Bill [HL] Explanatory Notes, introduced in the House of Lords on November 8, 2007 [HL Bill 6], Her Majesty's Stationery Office, 19, note 109 (emphasis added).
17. Liza Mundy, "A World of Their Own," *Washington Post Magazine,* March 31, 2002, W22.
18. "Couple 'Choose' to Have Deaf Baby," BBC News, April 8, 2002, http://news.bbc.co.uk/1/hi/health/1916462.stm.
19. For more in-depth analysis, see Steven D. Emery, Anna Middleton, and Graham H. Turner, "Whose Deaf Genes Are They Anyway? The Deaf Community Challenge to Legislation on Embryo Selection," *Sign Language Studies* 10, no. 2 (2010): 155–69.
20. Earl Howe, e-mail to Baroness Thornton, April 18, 2008, citing Richard Gray, "Couples Could Win Right to Select Deaf Baby," *Telegraph,* April 13, 2008, http://www.telegraph.co.uk/.
21. Emery, Middleton, and Turner, "Whose Deaf Genes Are They Anyway?," 160–61.
22. The original Web site was http://stopeugenics.org/, which is now archived at http://www.deaf-law.com/stopeugenics; the mailing-list archives are at http://deaf-law.com/mailman/listinfo/eugenics_deaf-law.com and http://deaf-law.com/mailman/listinfo/pr_deaf-law.com.

23. Alison Bryan, "HFEB: BDA Draft Letter to Professor Marcus Pembrey," *Grumpy Old Deafies*, November 28, 2007, http://www.grumpyoldeafies.com/.
24. Radio programs included BBC Radio 4, *Today;* BBC Radio 2, *The Jeremy Vine Show;* BBC Radio 4, *Women's Hour;* BBC Radio Live, *The Victoria Derbyshire Show;* BBC Radio 4, *The Moral Maze;* BBC World Service, *Have Your Say;* BBC Radio 4, *Today with Lord Winston and Professor Jones;* Canada CBC Radio, *As It Happens;* and BBC Radio Wales, *Good Morning Wales*. Television broadcasts appeared on BBC Breakfast, Scottish Television, BBC News, and ABC News (U.S.); also, requests had to be turned down, including from Channel 4 News (Jon Snow). Newspaper coverage included Robin McKie and Gaby Hinsliff, "This Couple Want a Deaf Child," *Observer,* March 8, 2008, http://www.guardian.co.uk/; Dominic Lawson, "Of Course a Deaf Couple Want a Deaf Child," *Independent,* March 11, 2008, http://www.independent.co.uk/; Lucy Cockcroft, "Couple Who Want a Deaf Child Angry at IVF Ban," *Telegraph,* March 11, 2008, http://www.telegraph.co.uk; Rebecca Atkinson, "My Baby, Right or Wrong," *Guardian,* March 9, 2008, http://www.guardian.co.uk; Sarah-Kate Templeton, "Choosing a Deaf Baby Is Criminal," *Sunday Times,* December 27, 2007; Hilary Freeman, "Creating a Deaf Child IS Immoral and No Parent Should Be Allowed to Choose This for Their Child," *Daily Mail,* March 12, 2008, http://www.dailymail.co.uk; "Letter from Jackie Scully: Hearing Beethoven," *Guardian,* March 12, 2008; "Emotional Squeamishness over Deaf Baby," *Herald Scotland,* March 14, 2008, http://www.heraldscotland.com; "Deafness and Disability: A Wonderful Response," *Times* (London); "Deaf Couple Wants to Use Genetic Selection to Have a Deaf Child," Catholic News Agency, March 13, 2008, http://www.catholicnewsagency.com; "Deliberately Choosing a Deaf Child Is Criminal," *Peninsula* (Qatar); "Let Parents Go Ahead and Have a Deaf Child," *Herald Scotland,* March 17, 2008, http://www.heraldscotland.com; David Blunkett, "Wanting a Deaf Child Is Daft," *London Sun,* http://www.thesun.co.uk/sol/homepage/news/columnists/blunkett/article692146.ece, accessed March 17, 2008; Steve Emery, untitled article, April 2008, *Disability Now* (London), http://www.disabilitynow.org.uk/latest-news2/deaf-activists-bill-and-201cdesigner-babies201d-storm. Media blogs included Cathy Heffernan, "The Hearing's Difficulties," *Guardian,* March 10, 2008, http://www.guardian.co.uk; India Knight, "Where Pro-Choice Feminism Collides with Disability Rights," *Times* (London); India Knight, "More on 'The Right to Be Deaf,'" *Times Online;* Rebecca Atkinson, "When Disability Becomes Illegal: We Can Screen Abnormalities Out before Birth, but Should We?" *BBC Ouch,* http://www.bbc.co.uk/ouch/features/when_disability_becomes_illegal_we_can_screen_abnormalities_out_before_birth_but_should_we.shtml, accessed February 8, 2014. Other online coverage is too numerous to list, but lists can be found at http://www.deaf-law.com/stopeugenics.
25. The debate was organized by the Progress Educational Trust and held on April 9, 2008. The march was organized by the Islington Deaf Campaign.
26. Emery, Middleton, and Turner, "Whose Deaf Genes Are They Anyway?," 165.
27. Human Fertilisation and Embryology Authority, Code of Practice, 8th ed. (London: Human Fertilisation and Embryology Authority, 2013), http://www.hfea.gov.uk/code.html. The eighth edition of the code has had six iterations to date. The previous versions can be found at http://www.hfea.gov.uk/2999.html, accessed February 14, 2014. The Code of Practice is laid before Parliament by the secretary of state for health in accordance with Section 26(4) of the 1990 Human Fertilisation and Embryology Act.
28. See the Human Fertilisation and Embryology Authority minutes of March 18, 2009, at http://www.hfea.gov.uk/1850.html, accessed February 14, 2014.
29. See Human Fertilisation and Embryology Authority Licence Committee, "An Application for 'Autosomal Recessive Non-syndromic Sensineural Deafness,' OMIM #220290, Mutation 167deIT mutation in Connexin 26 gene. OMIM 121011.0010," and "Minutes of a Licence Committee Held on 10th October 2001 at Paxton House at 10 AM," October 10, 2001, accessed November 15, 2011, http://www.hfea.gov.uk/docs/pdfsam_174.pdf.

30. See Human Fertilisation and Embryology Authority, "Licensing of Embryo Testing," March 18, 2009, accessed November 15, 2011, http://www.hfea.gov.uk/.
31. Human Fertilisation and Embryology Authority, *Code of Practice,* at 10.6.
32. Ibid., at 10.17.
33. Ibid., at 10.18.
34. Stop Eugenics, "Summary of Action Points from Meeting with Department of Health to Discuss Clause 14(4)(9) of the Human Fertilisation and Embryology Bill," March 19, 2008.
35. Department of Health, letter to Dr. Anna Middleton, April 3, 2008.
36. See Equality Act, 2010, c. 15 (Eng.), Part 3.
37. Human Fertilisation and Embryology Authority, *Code of Practice,* at 11.19.
38. "Protected characteristics" are listed in the 2010 Equality Act, Chapter 1. The act provides for antidiscrimination measures in respect to age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex, and sexual orientation. Out of these protected characteristics, only disability is subject to interpretation in respect to "serious physical, psychological or medical harm" and to a "consideration of the welfare of any resulting child."
39. Human Fertilisation and Embryology Authority, *Code of Practice,* at 11.20.
40. Ibid., at 11.12.
41. Ibid., at 11.13.
42. Ibid., at 11.24.
43. "Is the decision not to completely rule out the use of affected donors reasonable?" and "Is the decision to not completely rule out the use of affected embryos appropriate?," Progress Educational Trust, http://www.progress.org.uk/hfeacop9 and http://www.progress.org.uk/hfeacop10, respectively, accessed February 14, 2014.
44. S. H. and Others v. Austria (application no. 57813/00), November 3, 2011.
45. "Austrian Ban on Using Sperm and Ova Donation for In Vitro Fertilisation No Breach of the Convention," European Dignity Watch, November 4, 2011, http://www.europeandignitywatch.org/it/day-to-day/detail/article/austrian-ban-on-using-sperm-and-ova-donation-for-in-vitro-fertilisation-no-breach-of-the-convention.html.
46. Department of Health, "Impact Assessment on the Human Fertilisation and Embryology Bill (2008)," 17, accessed November 15, 2011, http://www.dh.gov.uk.
47. Ibid.
48. See Doug Alker, *Really Not Interested in the Deaf* (self-published, 2000); Bauman, *Open Your Eyes;* Alison Bryan, "Lack of Parliamentary Democracy for Deaf People?" *Grumpy Old Deafies*, accessed November 15, 2011, http://www.grumpyoldeafies.com.
49. Middleton, Hewison, and Mueller, "Prenatal Diagnosis for Inherited Deafness."
50. Emery, Middleton, and Turner, "Whose Deaf Genes Are They Anyway?"
51. Gloria Foran, at UNISON, e-mail, quoted by Sylvia O. Simmonds in post to Eugenics List, April 13, 2008, accessed November 15, 2011, http://deaf-law.com/.
52. Steve Emery, quoted in McKie and Hinsliff, "This Couple Want a Deaf Child."
53. See, for example, Luisa Maffi, "Linguistic, Cultural, and Biological Diversity," *Annual Review of Anthropology* 29 (2005): 599–617.
54. Jackie Leach Scully, *Disability Bioethics: Moral Bodies, Moral Difference* (Lanham, Md.: Rowman & Littlefield, 2008), 68–69.
55. Teresa Blankmeyer Burke, "Quest for a Deaf Child: Ethics and Genetics" (PhD diss., University of New Mexico, 2011), 94.
56. Humphries, "Talking Culture and Culture Talking," 37.
57. Joseph J. Murray, "Coequality and Transnational Studies: Understanding Deaf Lives," in Bauman, *Open Your Eyes*, 102.
58. Paddy Ladd, "Colonialism and Resistance: A Brief History of Deafhood," in Bauman, *Open Your Eyes,* 43.

59. Susan Merry, "Law and Colonialism," *Law and Society Review* 25 (1991): 889–922, cited by Ladd, ibid., 42.
60. See World Association of Sign Language Interpreters, "Sign Language Recognition in the World and Related Topics," accessed November 15, 2011, http://www.anios.it; and Hand Speak.com, "Sign Languages around the World," accessed November 15, 2011, http://www.handspeak.com.
61. See Emery, Middleton, and Turner, "Whose Deaf Genes Are They Anyway?," for a detailed exploration of how Section 14(4)(9) was challenged.
62. Martha T. McCluskey, "How Queer Theory Makes Neoliberalism Sexy," in *Feminist and Queer Legal Theory: Uncomfortable Encounters, Uncomfortable Conversations*, ed. Martha Albertson Fineman, Jack E. Jackson, and Adam Romeo (Surrey, UK: Ashgate, 2009), 125.
63. Patricia A. Cain, "Feminist Legal Scholarship," *Iowa Law Review* 77, no. 19 (1991): 21.
64. Kruse v. Johnson (1898) 2 Q.B. 91.
65. Baroness Hale in Ghaidan v. Godin-Medoza, (2004) 30 H.L. 132.
66. See the "U.N. Convention on the Rights of Persons with Disabilities," http://www.un.org/disabilities.
67. In the case of the United Kingdom, this involves the Council of Europe and the European Union. However, international regional organizations exist throughout the world. They include the African Union, the Arab League, the Organization of American States, and the Association of Southeast Asian Nations.
68. Examples include, in the United Kingdom, the Equality Act of 2010 and, in the United States, the Americans with Disabilities Act of 1990.
69. Stephen Wilkinson, "Eugenics, Embryo Selection, and the Equal Value Principle," *Critical Ethics* 1 (2006): 48.
70. Chamallas, *Introduction to Feminist Legal Theory*.
71. World Health Organization, "International Classification of Impairments, Disabilities and Handicaps (ICIDH)" (1980). A revised edition, ICIDH-2, published in 2001, is available at http://www.sustainable-design.ie/arch/ICIDH-2Final.pdf, accessed February 10, 2014.
72. World Health Organization, "International Classification of Functioning, Disability, and Health (ICF)" (2001), 10, at http://www.who.int/classifications/icf/en/.
73. See the Equality Act of 2010: Section 6(1) requires "mental or physical impairment" that has "substantial and long-term adverse effect on day to day activities" for the protected characteristic criteria (Section 4) to be met. http://www.legislation.gov.uk/ukpga/2010/15/contents.
74. Martha Minow, *Making All the Difference: Inclusion, Exclusion, and American Law* (Ithaca, N.Y.: Cornell University Press, 1990).
75. Minow's arguments are summarized in Chamallas, *Introduction to Feminist Legal Theory*, 89.
76. Ibid.
77. Sari Levanen and Dorothy Hamdorf, "Feeling Vibrations: Enhanced Tactile Sensitivity in Congenitally Deaf Adults," *Neuroscience Letters* 301 (2001): 75–77.
78. Daphne Bavelier, Matthew W. G. Dye, and Peter C. Hauser, "Do Deaf Individuals See Better?," *Trends in Cognitive Science* 10 (2006): 512–18.
79. Charlotte Codina et al., "Visual Advantage in Deaf Adults Linked to Retinal Changes," *PLoS ONE* 6, no. 6 (2011): e20417. doi:10.1371/journal.pone.0020417, referencing Helen J. Neville and Donald Lawson, "Attention to Central and Peripheral Space in a Movement Detection Task: An Even Related Potential and Behavioral Study (ii); Congenitally Deaf Adults," *Brain Research* 405, no. 2 (1987): 268–83; W. H. Loke and S. Song, "Central and Peripheral Processing in Hearing and Non-hearing Individuals," *Bulletin of the Psychonomic Society* 29, no. 5 (1991): 437–40; Rain G. Bosworth and Karen R. Dobkins, "The Effects of Spatial Attention on Motion Processing in Deaf Signers, Hearing Signers, and Hear-

ing Nonsigners," *Brain and Cognition* 49 (2002): 170–81; Philippe Stivalet et al., "Differences in Visual Search Tasks between Congenitally Deaf and Normally Hearing Adults," *Cognitive Brain Research* 6 (1998): 227–32; Jason Proksch and Daphne Bavelier, "Changes in the Spatial Distribution of Visual Attention after Early Deafness," *Journal of Cognitive Neuroscience* 14 (2002): 687–701; Teresa C. Chen et al., "Histologic Correlation of In Vivo Optical Coherence Tomography Images of the Human Retina," *American Journal of Ophthalmology* 141, no. 6 (2006): 1165–68; and J. M. Colmenero et al., "Mechanisms of Visuospatial Orienting in Deafness," *European Journal of Cognitive Psychology* 16, no. 6 (2004): 791–805.

80. Codina et al., "Visual Advantage in Deaf Adults Linked to Retinal Changes," quoting Courtney Stevens and Helen Neville, "Neural Plasticity as a Double-Edged Sword: Deaf Enhancements and Dyslexic Deficits in Motion Processing," *Journal of Cognitive Neuroscience* 18, no. 5 (2006): 701–14. See also David Buckley et al., "Action Video Game Players and Deaf Observers Have Larger Goldmann Visual Fields," *Vision Research* 50 (2010): 548–56.
81. Codina et al., "Visual Advantage in Deaf Adults Linked to Retinal Changes."
82. University of California, Davis, "Deaf Sign Language Users Pick Up Faster on Body Language," January 12, 2012, http://news.ucdavis.edu/search/news_detail.lasso?id=10107.
83. Jennifer S. Hendricks, "Essentially a Mother," *William and Mary Journal of Women and Law* 429, no. 13 (2007): 479.
84. Ian F. Haney Lopez, "The Social Construction of Race: Some Observations on Illusion, Fabrication, and Choice," *Harvard Civil Rights–Civil Liberties Law Review* 1, no. 29 (1994): 6.
85. Harlan Lane, "Ethnicity, Ethics, and the Deaf World," *Journal of Deaf Studies and Deaf Education* 10, no. 3 (2005): 291–310; Harlan Lane, Richard C. Pillard, and Ulf Hedberg, *The People of the Eye: Deaf Ethnicity and Ancestry* (Oxford: Oxford University Press, 2011).
86. U.N. Convention on the Prevention and Punishment of the Crime of Genocide (adopted by Resolution 260, December 9, 1948, entry into force January 12, 1951, in accordance with Article 13), Treaty Series, vol. 78, 277.
87. See Bill Armer, "In Search of a Social Model of Disability: Marxism, Normalcy, and Culture," in *Implementing the Social Model of Disability: Theory and Research,* ed. Colin Barnes and G. Mercer (Leeds, UK: Disability Press, 2004), 48–64.
88. Maffi, "Linguistic, Cultural, and Biological Diversity."
89. Ilmari Pyykkö et al., "Noise-Related Hearing Impairment," in *Genes, Hearing, and Deafness: From Molecular Biology to Clinical Practice*, ed. Alessandro Martini, Dafydd Stephens, and Andrew P. Read (London: Informa Healthcare, 2007), 91–109.
90. M. Pfister and Anil K. Lalwani, "Gene Therapy of the Inner Ear," in Martini, Stephens, and Read, *Genes, Hearing, and Deafness,* 299–304.
91. Chamallas, *Introduction to Feminist Legal Theory.*
92. Nancy Fraser and Linda Gordon, "A Genealogy of Dependency: Tracing a Keyword of the U.S. Welfare State," *Signs* 19, no. 21 (1994): 309–36.
93. Chamallas, *Introduction to Feminist Legal Theory,* chap. 9.
94. Martha Albertson Fineman, "The Nature of Dependencies and Welfare Reform," *Santa Clara Law Review* 36, no. 2 (1996): 288.
95. Peter A. Hindley et al., "Psychiatric Disorder in Deaf and Hearing Impaired Children and Young People," *Journal of Child Psychology and Psychiatry* 35, no. 5 (1994): 917–34.
96. See Paddy Ladd, *Understanding Deaf Culture;* Emery, *Citizenship and the Deaf Community;* and Bauman, *Open Your Eyes.*
97. As part of the Stop Eugenics campaign, e-mail lists were hosted at deaf-law.com, and regular discussions took place to organize the campaign (November 2007–June 2008). In addition to more open discussion, private communication took place between some activists within Stop Eugenics, which the authors were privy to.

98. See Katharine T. Bartlett, "Gender Law," *Duke Journal of Gender Law and Policy* 1 (1994): 17n78.
99. See ibid., 1–20; and Deborah L. Rhode, *Gender and Law: Theory, Doctrine, Commentary,* 5th ed. (Austin, Tex.: Wolters Kluwer Law & Business, 2010).
100. Chamallas, *Introduction to Feminist Legal Theory,* chap. 5.
101. Bartlett, "Gender Law," 16.

II

LANGUAGE **GAINS**

4

THREE REVOLUTIONS

Language, Culture, and Biology

LAURA-ANN PETITTO

Among the most daunting words in the English language has to be the word *but*. Though just a teeny-tiny runt of a word when up against the likes of such words as *truth, justice, tolerance,* and *diversity,* it has a power that can nonetheless arrest, derail, and alter personal history. Few mere mortals among us have escaped the dangling agony at the cliff of "I love you, but . . ." or have avoided the late-night despair when our child finally phones home sheepishly saying, "I would have come home on time, but . . ."—and so on and so forth. We pull ourselves together. We deal with it. We move on. This is not the "but" that breaks us. It is another "but" that does much more harm, a "but" that devastates, subjugates, and alters human history.

I have come to know this "but" well. As a scientist whose research spans the past three decades, I have met this "but" many times after lectures that I've given at scientific conferences reporting that signed and spoken languages are acquired by young children in identical ways, or that signed language in the brains of deaf individuals is processed similarly to spoken language in the brains of hearing people. I know well the polite gaze, the hushed tone of the retort "*But* . . . surely, speech is *better*." I have met this same "but" when teaching medical school students and talking with doctors. I have met it while talking to politicians, policy makers, and educators. I have even met this "but" when simply chitchatting with the person next to me on an airplane.

With much power, this "but" along with its sister phrase "speech is better" have impacted the world. Like Mutt and Jeff, the two have seemed inseparable, and they have fueled enduring views that are especially noteworthy because people expressing them are apt to note that they mean no harm, as what they are expressing is (to them) self-evident, logical, and true.

Is it?

I began asking this question years ago as my scientific data began revealing a pattern that wouldn't be shaken. Converging across multiple types of studies (behavioral and brain imaging), multiple populations (deaf and hearing; infants,

children, and adults), multiple signed and spoken languages (American Sign Language, Langue des Signes Quebecoise [LSQ, the signed language used among culturally French deaf people in Quebec and other parts of French Canada], Italian Signed Language, French Signed Language, and spoken English, French, Italian), and multiple countries (the United States, Canada, Italy, France), signed and spoken languages were somehow . . . the same. So what could "*But* . . . surely, speech is *better*" possibly mean? I asked myself. More to the point, what does "better" mean?

I reasoned that "better" could not mean that only spoken language is a "real" language and signed language is not—at least not anymore—as most educated conference participants that I've met (scientists, doctors, policy makers, educators, and the like) jump to acknowledge that, of course, signed languages are real languages. It also appears that "better" is not simply a reflection of the public failing to understand that deaf people have a unique culture. I have found that most colleagues readily offer their understanding that deaf people have a distinct culture. Instead, "better" appeared to mean *biologically* better, superior. On this view, speech is presumed to be biologically superior to sign. How could this be? Such an assumption should be either supported or refuted with careful examination of the experimental facts before us, or so I thought. And the facts before me were demonstrating that the assumption is wrong: sign and speech are represented and processed in largely equivalent ways in the human brain. Consequently, there's no basis for the "but . . ." In fact, I reasoned that the "but . . ." may be supporting unsupportable prejudice.

So the good scientist in me set out to test what I've come to call the "but" hypothesis: but . . . *is* speech biologically better? How could we know? How would we test this?

Scientific pioneers in history have faced the question head-on. For example, in his now-classic book on the biological foundations of language, Eric Lenneberg taught us that language-like behavior suspected of being part of our biological capacity should evidence regular development in the face of environmental vagaries, achieve mastery of the target capacity on a maturational timetable over development, and display other features involving the brain's neural tissue and its dedication.[1] The candidate behavior should also evidence differences from other capacities, perhaps even those that afford advantages.

In this chapter, I consider three revolutions in thought over the past fifty years that have provided science and society with empirical evidence regarding the prevailing assumption called here the "but . . . speech is better" hypothesis. Taken together, the three types of evidence do not support this hypothesis and instead provide a principled impetus for change—to change our minds and to alter the course of a misguided history.

They say that good things come in threes. Here, the three types of revolution-

ary thought include these: Linguistic analyses have demonstrated that signed languages are "real" languages. Cultural analyses have revealed that groups of deaf people around the world constitute cultures. Last but not least, biological evidence has demonstrated that signed and spoken languages are biological equivalent—not to mention the fact that aspects of visual processing and higher cognition in early sign-exposed deaf individuals are advantaged and enhanced as compared with the same aspects in hearing peers. Evidence from the collective revolutions in thought is clear: speech is not better than sign. Like a Gamma Knife, the power to cut out wrong and ill-fated material can come only when all rays—all three revolutions in thought—are aimed focally together.

Revolution 1: Language

Revolutions can occur in many ways. More than a half century ago, a revolution in human knowledge began. It was a quiet revolution. Following only three years after Noam Chomsky's famous publication of *Syntactic Structures*, in 1957,[2] this revolution started in 1960 with a single publication by a young man who, by profession, was a scholar in classical English literature, Chaucer in particular. He was also a professor at Gallaudet University in the United States, now a bilingual university for Deaf and hard-of-hearing students where the primary languages used are American Sign Language (ASL) and English. The professor's name was William Stokoe, and, by using classical linguistic analyses, he "cracked the code" for the "phonological level" of language organization in ASL.[3]

The discovery of a phonological level of language organization in ASL was noteworthy within the discipline of linguistics regarding the linguistic status of human signed languages. At the time, signed languages were viewed largely as "gestures" or "pictures in the air," lacking in any formal rules, underlying grammatical principles and regularities, and, crucially, sublexical organization that lie at the heart of human spoken languages. Indeed, signed languages were viewed as lacking in all that was required to be a "real" language. In the decades to come, the discovery of a sublexical, sign-based phonological level of language organization in signed languages would serve as a springboard for extraordinary discoveries about the biological basis of all language in the human brain. These discoveries would challenge our assumptions about the very nature and essence of human language in our species.

We now understand, of course, that the phonological level of language organization is found in all human languages, be they signed or spoken. This particular level of structure in human language is formed from a restricted set of bits and pieces of meaningless language units. These units are combined according to the rules of a particular language to make up the potentially infinite set of words or signs (and sentences) possible in spoken or signed language. In the case of spoken language, the restricted set of units comprises meaningless sounds, and in

the case of signed languages, the restricted set of units comprises meaningless hand forms in front of the signer's body (with restricted locations, movements, and orientations).

When Stokoe first invited me to be a researcher in his laboratory, in 1978, he was still passionately probing the linguistic regularities of ASL phonology, trying to crack the code for what types of variation are possible in its surface hand units (sign phones and sign allophones), and from which restricted set of underlying categories of hand units they are derived (sign phonemes). I came to Stokoe from Ursula Bellugi's sign-language laboratory at the Salk Institute for Biological Studies in La Jolla, California, where I had begun comparative language-acquisition studies of young deaf and hearing babies. I was en route to Harvard University, where I was going to conduct psycholinguistic and language-acquisition studies with Roger Brown and Noam Chomsky.

Stokoe and his students' insistence on the existence of a sign-based phonology (including his student Ben Bahan) and Stokoe's impressive reams of data and analyses were dazzling to me and would form a foundational impetus for my journey into the human brain to come. If the signed languages used by Deaf people were indeed part of the set of "real" languages of the world, Stokoe reasoned, then ASL had to exhibit the "phonological" level of language organization as well. It did. Following from Stokoe and his team's discoveries, four decades of formal linguistic analyses by thousands of linguistic scientists around the world have demonstrated that the world's signed languages, including ASL, Italian Signed Language, French Signed Language, LSQ, and other signed languages also have a "phonological level" of language organization that is identical to that of spoken languages.[4]

Beyond phonology, linguistic analyses have also laid bare the rich grammars of the world's natural signed languages, demonstrating that they exhibit morphological, syntactic, semantic, discourse, and pragmatic levels of language identical to those of spoken languages. To be sure, the results of this first revolution emanating from linguistic science have resoundingly demonstrated that the natural signed languages of deaf people around the world are real languages on formal linguistic grounds.

Revolution 2: Culture

A second revolution in thought began in the mid-1960s and 1970s. Here, both the scientific researchers studying natural signed languages and the Deaf people who used them began articulating the contours of Deaf culture.[5] Deaf people in different countries constitute a distinct cultural group of people among the majority culture. They have a natural language with which they live, work, and raise their children. Within Deaf culture there are Deaf traditions; customs; humor (including classic Deaf jokes); and art in vastly different formats, including stunning visual poetry, theater, literature, popular print-media venues (such as journals,

newspapers, and magazines), Internet venues (such as visual journals), cinema (including films by Deaf film directors), forms of dance and rhythmic expression common to music. To be sure, Deaf culture possesses all those features universal to being human. All of these features bind Deaf people into an authentic culture within the different countries of the world and, again, are precisely the dimensions that bind hearing people into many distinct cultures. As the revolution in understanding Deaf culture has been explored in numerous, readily accessible works, the focus of this chapter is on the third, and less well known, revolution in understanding the biological properties of linguistic processing and subsequent Deaf gains.[6]

Revolution 3: Biology

The third revolution began in the mid-1990s with the explosion of advanced neuroimaging technologies in combination with state-of-the-art behavioral methods, and continues through today. This particular revolution has brought about a most important advance in our understanding of the human mind, human language, and human signed languages. It involves the discovery from a wide array of disciplines within the neurosciences (especially the developmental cognitive neurosciences) that signed and spoken languages are *biologically equivalent*.

Scientific discoveries from my own lab of deaf and hearing researchers, for example, have found that signed and spoken languages are acquired by young deaf and hearing babies (respectively) in the same way and, crucially, on the same maturational timetable. That we observe an identical maturational time course shared across spoken and signed language acquisition is key. Despite radical modality differences between the hand and tongue—and despite the vast differences in home rearing, language, and cultural environment—human sign-exposed and speech-exposed children acquire language in similar ways. Such surprising similarities suggest that similar shared and biologically equivalent brain-based mechanisms underlie signed and spoken languages and contribute to the many complex factors that make possible human language acquisition. To be sure, early exposure to a signed language yields entirely normal development of human language acquisition. And this is dramatically so!

Young sign-exposed deaf babies produce manual babbling (yes, they babble on their hands!) at the identical developmental time when hearing babies produce vocal babbling (onset around six months). Deaf babies produce the same meaningless, rhythmically alternating (sign) phonetic and (sign) syllabic structures, and exhibit the same stages of babbling, over the first year of life.[7]

The human brain carves out onto the human hand the identical linguistic structures irrespective of modality differences (hands versus tongue). Interestingly, the babbling period is so central to early human language development that we also see it emerge in hearing babies in deaf homes who are exposed only to a signed language in early life. Here, they babble manually, though not vocally. We

also observe babbling in bilingual hearing babies who are exposed to sign and speech from birth and who produce, discretely, both manual and vocal babbling.

The remarkable discovery of manual babbling in young sign-exposed babies caught the scientific world's attention, because "babbling" was thought to be a universal milestone exclusive to human spoken-language acquisition that is fundamentally tied to (caused by) the development of the mouth and the hearing of sounds. It is not. Instead, the discovery of manual babbling was the first in a series of findings that would decouple human language from speech and suggest that the human brain must contain a finely honed sensitivity to *specific* underlying patterns at the heart of human language *structure,* rather than modality.[8]

Beyond babbling, when sign-exposed deaf babies (and hearing babies of deaf parents) reach the "first-word" milestone in sign language, the underlying concepts expressed in their early signs refer to the same things in the world as they do for a hearing child (irrespective of any ostensible sign "iconicity" at the lexical level). The young sign-exposed baby's development of semantic concepts and categories is also the same as a hearing child's. All children pass through the same early pragmatic, discourse, morphological, and syntactic developments irrespective of differences in language modality, language typology, and language topological structure.[9]

How can this be? At the time, such findings didn't make sense in light of the scientific discipline's looming theories involving the ostensibly biologically superior status of speech—specifically, that the maturation of speech perception and speech production mechanisms are the exclusive engine that drives early human language acquisition. If the brain's mechanisms for speech and sound development alone were driving a young hearing baby's language-acquisition milestones, how could it be that young deaf babies acquiring signed languages—languages without speech and sound—also achieved identical language milestones in sign and produced identical language structures (such as babbling), all on an identical timetable?

A new answer: in 2000, my team and I made the surprising discovery that key parts of human language structure were governed by the identical *brain tissue* across spoken and signed languages. Most noteworthy, this was true even for parts of human language structure that have been classically associated with sound and speech, such as phonology and phonological segmentation in language, and which, in turn, had been neuroanatomically linked to parts of the human brain assumed to be the lone bastion for the processing of sound for the past 125 years (specifically, the planum temporale [PT] in the superior temporal gyrus [STG]). Here we found that brain tissue and networks classically associated with speech and sound processing in hearing people also control sign-language processing for identical language functions.[10]

Our research had many intriguing findings, but, in particular, we found that

sign phonology is processed in the identical brain tissue as spoken phonology (PT/STG) even though signed languages have evolved in the absence of sound. Given the early behavioral-babbling and timing-milestone studies cited earlier, we were able to offer the hypothesis that the underlying "motor" driving spoken- and signed-language acquisition was biologically equivalent. Here, the new neuroimaging technology had permitted us to see that the brain tissue was indeed biologically identical!

Rather than being "set" for speech analysis, this STG tissue (previously assumed to be a unimodal sound-processing site that segments the linguistic stream into phonological units) is not exclusively sound-based at all. Instead, this tissue processes both the signed and speech linguistic streams and appears to be "set" for processing highly specific rhythmic-temporal alternating patterns (in maximal contrast) that lie at the core of all human-language phonological structure.

In addition to shared brain tissue underlying phonological processing for speech and sign, our team (and others) has discovered that all of the classic levels of language organization in spoken language (including phonology, morphology, syntax, and semantics) are processed in highly similar and overlapping brain tissue in deaf people processing signed languages.[11]

At our National Science Foundation, Science of Learning Center called Visual Language and Visual Learning, or VL2, in addition to observing that early sign exposure yields entirely normal language development, we have observed striking *advantages* to early-life exposure to a signed language. In the studies cited earlier, we observed select biologically equivalent brain structures underlying key parts of human signed- and spoken-language structure. In our center, we have observed that deaf children exposed to signed languages early in life demonstrate select advantages over age-matched hearing peers. This casts an entirely new light on the topic of Deaf Gain; here we have a biologically based Deaf Gain.

Biological development and early visual experience: Early exposure to a signed language in young deaf visual learners changes their visual processing and visual attention, a change that, in turn, has later "upstream" positive impact on higher cognition, language, and literacy, as well as on social-emotional self-regulation. Early-sign-exposed deaf infants attend to (and visually track) more robustly adult signers' faces and eye gaze, as compared to deaf and hearing infants with little or no exposure to signed language.[12] In turn, this permits the infant to learn vocabulary, meanings and reference (semantic relations), and language patterns rapidly. Studies of deaf toddlers reading books with their signing parents have found that these children's eye-gaze-tracking ability is indeed enhanced, resulting in increased early vocabulary, language, and literacy mastery, both in ASL and, most fascinating, in English.[13] And later in life, advantageous changes in visual processing are observed in deaf adult skilled readers, who show greatly increased reading eye span in English, as compared to hearing adult skilled readers.[14]

Biological development and early bilingual language experience: Early bilingual exposure to a natural signed language and a spoken language affords cognitive and, in a newly discovered finding, surprising language and reading advantages over age-matched monolingual children and adults. This holds for both deaf and hearing bilingual ASL/English children.[15] Notably, the studies reveal that early bilingual signed- and spoken-language exposure provides linguistic-processing strengths across both languages, and that access to a signed language *improves* a deaf child's performance in reading English. Moreover, early bilingual exposure affords the most robust and optimal lifelong cognitive and linguistic advantages over later dual- or second-language exposure.[16] Thus, old fears of language contamination and/or language delay when exposing a child to two languages early in life are scientifically unfounded. Similarly, old fears that early exposure to a signed language will hurt deaf children's acquisition of a spoken language are also scientifically unfounded, as instead we find powerful language and reading advantages in deaf children who are exposed early and bilingually to both signed and spoken language.

Biological development and the discovery of the role of visual phonology in learning to read English: Both neural and behavioral studies lay bare the brain's remarkable ability to develop alternative gateways to sound-based phonological decoding typical of, for example, an early English reader's use of sound phonological representations to access meaning from the printed word. There is now growing and very exciting evidence that young visual learners, deaf children, and adults also have—and use—a "visual phonological" level of language representation when accessing meaning from printed words in reading.[17] Here, the deaf reader is not using sound-based phonology but instead is using a visually based phonological level of language processing. This means that reading, which was once believed to require sound decoding in early reading to achieve reading mastery, need not require sound at all! What's in the deaf visual learner's brain regarding human language's "phonological" level of language organization appears to be, rather than sound phonological representations consisting of sound units, more akin to *visual* phonological representations consisting of *visual* units, including sensitivity to specific rhythmic-temporal patterning at the core of natural language structure, sign-phonetic and sign-syllabic units and their patterned movements, sign sentential prosodic patterning as well as visual finger spelling, and orthographic print patterns.[18]

That the human brain creates a visually based "phonological" level of language processing in the absence of sound is stunning in itself and reveals the centrality of this level of language organization in all human language processing. As we have seen, it also forces us to reconceptualize the nature of human language, as we see core levels of language organization being pushed out onto the hands and the tongue irrespective of language modality, and it decouples human language from speech.

Three Revolutions: Significance

Taken together, these three "quiet" revolutions can render a conceptual change in science and society. Yes, signed languages are "real" languages, and yes, deaf people have their own "real" culture, but the developmental and brain evidence does not support the "speech is superior" hypothesis. Instead, this new trilogy of evidence—the stunning identity of linguistic structure, culture, and biology across signed and spoken languages—has rendered a most remarkable revolution in thinking in our modern world regarding what human language is and what makes up being human. Speech and language have now been biologically decoupled. Speech is *not* language. "Language" resides in our brains and is distinct from its production. The *production* of language—be it either by the tongue or by the hands—is distinct from the *knowledge* of language. Knowledge of language is in our brains. The tongue is one means by which the brain can "out" human language—but not the only one. In early life, the human brain will take the hands if given the hands, or the tongue if given the tongue, and will treat them identically. In fact, the human brain does not discriminate between speech and sign but processes them identically, with *biological equivalence*. In light of this, it is indefensible to implement laws that deny Deaf individuals equal rights. How irregular it would be to have a human brain that does not discriminate between speech and sign, yet to live in a society that, flying in the face of human biological fact, makes laws that discriminate.

As a cognitive neuroscientist who has studied the biological foundations of human language for decades, I believe it is indefensible to implement public, medical, and educational practices that deny individuals who are deaf a basic human right—the right to early-life exposure to a natural human signed language. How can we do otherwise when decades of widespread scientific discoveries have demonstrated that signed languages are biologically equal in the human brain to the world's spoken languages? How can we do otherwise when science has demonstrated through powerful biological-developmental discoveries that early exposure to a signed language can provide cognitive and linguistic benefits in the developing signing deaf child? Especially fascinating, how can we do otherwise when we have consistently discovered that *all* children's early exposure to two languages—including a deaf child's early exposure to a signed and a spoken language, or a signing deaf child's exposure to English through print—affords remarkable, lifelong higher cognitive and linguistic benefits than monolingual exposure across the life span. How can we do otherwise when we have consistently discovered that early exposure to a signed language provides enhancements to the brain's visual-processing and visual-attention systems, which, in turn, provide benefits to the young deaf child's acquisition of vocabulary and language, as well as, most surprisingly, reading and literacy advantages? To be sure, how can we do otherwise when we have consistently observed the surprising: for example, that

early exposure to ASL provides reading advantages in English? Finally, how can we do otherwise when our science has consistently shown us that early exposure to a signed language affords advancements in the deaf child's social knowledge of the world, self-regulation, and, so important, the growing child's self-esteem?

We grow as human beings, as a culture, as a society, with new knowledge. We are enlightened. And the enlightenment that comes from new knowledge empowers us to change the world and make it a better place for all people. It is not new knowledge that is to be feared. Instead, the most profound damage we can do to ourselves and to others is to fail to see new knowledge before our eyes.

Notes

I am grateful to all the children, schools, teachers, principals, and superintendents who made decades of my research possible, as well as the many dozens of student researchers in my labs over the years, including my present lab, the Brain and Language Laboratory (BL2) at Gallaudet University, especially doctoral student Clifton Langdon, as well as the many members of the University of Toronto Cognitive Neuroscience Laboratory, especially doctoral student Kaja Jasinska. I am also grateful to all of the following granting agencies for funding this research and my research program: the National Institutes of Health (U.S.A.) 5R01HD045822 (behavioral and neuroimaging studies of bilingual reading) and the National Institutes of Health (U.S.A.) 5R21HD050558 (infants' neural basis for language using new NIRS), the University of Toronto, the Canadian Foundation for Innovation, the Ontario Research Fund, the SSHRC (Canada), the NSERC (Canada), the Spencer Foundation (U.S.A.), the National Science Foundation's Science of Learning Center, Visual Language and Visual Learning, or VL2 (NSF Grant SBE-0541953), and Gallaudet University. Send reprint requests to L. A. Petitto at Laura-Ann.Petitto@Gallaudet.edu. For related research, see http://petitto.gallaudet.edu/~petitto/index/index.php.

1. Eric Lenneberg, *Biological Foundations of Language* (New York: Wiley, 1967).
2. Noam Chomsky, *Syntactic Structures* (The Hague: Mouton, 1957).
3. William Stokoe, *Sign Language Structure: An Outline of Visual Communication Systems of the American Deaf* (Buffalo, N.Y.: Dept. of Anthropology and Linguistics, University of Buffalo, 1960).
4. Edward S. Klima and Ursula Bellugi, *The Signs of Language* (Cambridge, Mass.: Harvard University Press, 1979); Trevor A. Johnston and Adam Schembri, *Australian Sign Language (Auslan): An Introduction to Sign Language Linguistics* (Cambridge: Cambridge University Press, 2007); John Goldsmith, "What Is a Phonology of Sign Language?," *Revue Quebecoise de Linguistique Theorique et Appliquee* 10, no. 1 (1991): 11–20; Christian Cuxac, "Visual-Gestural Communication of the Deaf," *Etudes de Linguistique Appliquee* 36 (October–December 1979): 30–40; Ronnie Wilbur, "Linguistic Description of a Sign Language." *Languages* 13, no. 56 (1979): 13–34.
5. Carol Padden and Tom Humphries, *Inside Deaf Culture* (Cambridge, Mass.: Harvard University Press, 2005); H-Dirksen L. Bauman, ed., *Open Your Eyes: Deaf Studies Talking* (Minneapolis: University of Minnesota Press, 2008).
6. See Padden and Humphries, *Inside Deaf Culture;* Harlan Lane, Ben Bahan, and Robert Hoffmeister, *A Journey into the Deaf-World* (San Diego: DawnSignPress, 1996); and Harlan Lane, *The Mask of Benevolence: Disabling the Deaf Community* (San Diego: DawnSignPress, 1999), among others.
7. Laura Ann Petitto and Paula Marentette, "Babbling in the Manual Mode: Evidence for the Ontogeny of Language," *Science* 251 (1991): 1483–96; Laura Ann Petitto, Siobhan Holowka, Lauren Sergio, and David Ostry, "Language Rhythms in Baby Hand Movements," *Nature* 413 (2001): 35–36; Laura Ann Petitto, Siobhan Holowka, Lauren Sergio, Bronna Levy, and

David Ostry, "Baby Hands that Move to the Rhythm of Language: Hearing Babies Acquiring Sign Languages Babble Silently on the Hands," *Cognition* 93 (2004): 43–73.

8. Virginia Penhune et al., 'The Morphometry of Auditory Cortex in the Congenitally Deaf Measured using MRI," *NeuroImage* 20 (2003): 1215–25; Petitto and Marentette, "Babbling in the Manual Mode."
9. Laura-Ann Petitto, Marina Katerelos, et al., "Bilingual Signed and Spoken Language Acquisition from Birth: Implications for the Mechanisms Underlying Early Bilingual Language Acquisition," *Journal of Child Language* 28, no. 2 (2001): 453–96; Petitto, Holowka, Sergio, and Ostry, "Language Rhythms in Baby Hand Movements"; Laura-Ann Petitto and Siobhan Holowka, "Evaluating Attributions of Delay and Confusion in Young Bilinguals: Special Insights from Infants Acquiring a Signed and Spoken Language," *Sign Language Studies* 3, no. 1 (2002): 4–33.
10. Laura-Ann Petitto et al., "Speech-like Cerebral Activity in Profoundly Deaf People Processing Signed Languages: Implications for the Neural Basis of Human Language," *Proceedings of the National Academy of Sciences of the United States of America* 97, no. 25 (2000): 13961–66.
11. Ibid.; Gregory Hickok, Ursula Bellugi, and Edward S. Klima, "The Neurobiology of Sign Language and Its Implications for the Neural Basis of Language," *Nature* 381, no. 6584 (1996): 699–702; Ruth Campbell, Mairéad MacSweeney, and Dafydd Waters, "Sign Language and the Brain: A Review," *Journal of Deaf Studies and Deaf Education* 13, no. 1 (2008): 3–20; Karen Emmorey, "The Neural Systems Underlying Sign Language," *Oxford Handbook of Deaf Studies, Language, and Education* (New York: Oxford University Press, 2003), 361–76.
12. Rain G. Bosworth and Karen R. Dobkins, "Visual Field Asymmetries for Motion Processing in Deaf and Hearing Signers," *Brain and Cognition* 49, no. 1 (2002): 170–81; Matthew W. G. Dye, Peter C. Hauser, and Daphne Bavelier, "Visual Attention in Deaf Children and Adults: Implications for Learning Environments," in *Deaf Cognition: Foundations and Outcomes,* ed. Marc Marschark and Peter C. Hauser (Oxford: Oxford University Press, 2008), 250–63.
13. David Corina and Jenny Singleton, "Developmental Social Cognitive Neuroscience: Insights from Deafness," *Child Development* 80, no. 4 (2009): 952–67; Amy M. Lieberman, Marla Hatrak, and Rachel I. Mayberry, "The Development of Eye Gaze Control for Linguistic Input in Deaf Children," *Proceedings of the Annual Boston University Conference on Language Development* 35, no. 2 (2011): 391–403; Rachel I. Mayberry, Alex A. del Giudice, and Amy M. Lieberman, "Reading Achievement in Relation to Phonological Coding and Awareness in Deaf Readers: A Meta-analysis," *Journal of Deaf Studies and Deaf Education* 16, no. 2 (2011): 164–88.
14. Nathalie N. Bélanger et al., "Skilled Deaf Readers Have an Enhanced Perceptual Span in Reading," *Psychological Science* 23, no. 7 (2012): 816–23; Daphne Bavelier, Matthew W. G. Dye, and Peter C. Hauser, "Do Deaf Individuals See Better?," *Trends in Cognitive Sciences* 10, no. 11 (2006): 512–18; Daphne Bavelier, Craig Brozinsky, et al., "Impact of Early Deafness and Early Exposure to Sign Language on the Cerebral Organization for Motion Processing," *The Journal of Neuroscience* 21, no. 22 (2001): 8931–42.
15. Petitto and Holowka, "Evaluating Attributions of Delay and Confusion in Young Bilinguals"; Laura-Ann Petitto, "Modularity and Constraints in Early Lexical Acquisition: Evidence from Children's Early Language and Gesture," in *Modularity and Constraints in Language and Cognition,* ed. Megan R. Gunnar and Michael Maratsos (Hillsdale, N.J.: Erlbaum, 1992), 25–58; Petitto, Katerelos, et al., "Bilingual Signed and Spoken Language Acquisition from Birth"; Ioulia Kovelman, Stephanie A. Baker, and Laura-Ann Petitto, "Age of First Bilingual Language Exposure as a New Window into Bilingual Reading Development," *Bilingualism: Language and Cognition* 11, no. 2 (2008): 203–23; Ioulia Kovelman, Stephanie A. Baker, and Laura-Ann Petitto, "Bilingual and Monolingual Brains

Compared: A Functional Magnetic Resonance Imaging Investigation of Syntactic Processing and a Possible 'Neural Signature' of Bilingualism," *Journal of Cognitive Neuroscience* 20, no. 1 (2008): 153–69; Brittany Freel et al., "Deaf Individuals' Reading Skills: Bilingual and Family Impacts" (paper presented at the 22nd Annual Convention of the Association for Psychological Science, Boston, Mass., 2010); Brittany L. Freel et al., "Deaf Individuals' Bilingual Abilities: American Sign Language Proficiency, Reading Skills, and Family Characteristics," *Psychology* 2, no. 1 (2011): 18–23; Peter C. Hauser and Marc Marschark, "What We Know and What We Don't Know about Cognition and Deaf Learners," in Marschark and Hauser, *Deaf Cognition,* 439–57; Ioulia Kovelman, Mark H. Shalinsky, et al., "Dual Language Use in Sign–Speech Bimodal Bilinguals: fNIRS Brain-Imaging Evidence," *Brain and Language* 109, nos. 2–3 (2009): 112–23; Laura Ann Petitto and Ioulia Kovelman, "The Bilingual Paradox: How Signing-Speaking Bilingual Children Help Us Resolve Bilingual Issues and Teach Us about the Brain's Mechanisms Underlying All Language Acquisition," *Learning Languages* 8, no. 3 (2003): 5–18; Laura Ann Petitto, Melody S. Berens, et al., "The 'Perceptual Wedge Hypothesis' as the Basis for Bilingual Babies' Phonetic Processing Advantage: New Insights from fNIRS Brain Imaging," *Brain and Language* 121, no. 2 (2012): 142–55.

16. Petitto and Holowka, "Evaluating Attributions of Delay and Confusion in Young Bilinguals"; Petitto et al., "'Perceptual Wedge Hypothesis' as the Basis for Bilingual Babies' Phonetic Processing Advantage"; Petitto and Kovelman, "The Bilingual Paradox"; Kovelman, Baker, and Petitto, "Age of First Bilingual Language Exposure as a New Window into Bilingual Reading Development"; Kovelman, Baker, and Petitto, "Bilingual and Monolingual Brains Compared"; Jill P. Morford et al., "When Deaf Signers Read English: Do Written Words Activate Their Sign Translations?," *Cognition* 118, no. 2 (2011): 286–92; Jill P. Morford and Rachael I. Mayberry, "A Reexamination of 'Early Exposure' and Its Implications for Language Acquisition by Eye," in *Language Acquisition by Eye,* ed. Charlene Chamberlain, Jill P. Morford, and Rachel I. Mayberry (Mahwah, N.J.: Erlbaum, 2000), 111–27; Jill P. Morford et al., "Effects of Language Experience on the Perception of American Sign Language," *Cognition* 109, no. 1 (2008): 41–53; Pilar Piñar, Paola E. Dussias, and Jill P. Morford, "Deaf Readers as Bilinguals: An Examination of Deaf Readers' Print Comprehension in Light of Current Advances in Bilingualism and Second Language Processing," *Language and Linguistics Compass* 5, no. 10 (2011): 691–704.
17. Piñar, Dussias, and Morford, "Deaf Readers as Bilinguals"; Karen Emmorey and Jennifer A. F. Petrich. "Processing Orthographic Structure: Associations between Print and Fingerspelling," *Journal of Deaf Studies and Deaf Education* 17, no. 2 (2012): 194.
18. Petitto, Holowka, Sergio, and Ostry, "Language Rhythms in Baby Hand Movements"; Piñar, Dussias, and Morford, "Deaf Readers as Bilinguals"; Emmorey and Petrich, "Processing Orthographic Structure."

5

DEAF GAIN IN EVOLUTIONARY PERSPECTIVE

DAVID ARMSTRONG

One approach to assessing Deaf Gain is to ask what the Deaf experience has contributed to the sum total of human knowledge. That is, what benefit has the Deaf experience conferred on humanity in general, as opposed to deaf people in particular? This chapter will approach the question from the perspective of human evolution, and it will follow two separate but ultimately related threads. The first thread is probably familiar to most readers of this book; it concerns the contribution that study of human signed languages has made to the study of human evolution in general and the evolution of the human capacity for language in particular. Study of the linguistic structure of signed languages that was begun in the 1950s by William C. Stokoe and others has made a major contribution to the much more ancient gestural theory of language origins, and consideration of the history of that theory comprises the next part of this chapter. The second thread, introduced in the final section of the chapter, is of somewhat more recent origin and addresses particularly what can be learned from the application of principles of cultural evolution to the study of the visual communication of Deaf people. In particular, it can be assumed that as their signed languages develop over time, Deaf people introduce features that tend to make optimal use of the human capacity for visual communication.

The Gestural Theory of Language Origins

The idea that iconic visible gesture—specifically as represented by the signed languages of the deaf—had something to do with the origin of language, particularly speech, is a frequent element in speculation about its origin and appears early in the history of such speculation. For example, Socrates hypothesizes about the origins of Greek words in Plato's satirical dialogue *Cratylus*. Socrates's argument includes a possible role for sound-based iconicity as well as for the kinds of visual gestures employed by the deaf. Plato's use of satire to broach this topic also points to the fine line between the sublime and the ridiculous that has continued to be a hallmark of this sort of speculation. Here I will consider the modern evidence supporting the idea that language first arose as visible gesture, and I will show that

Deaf Gain, in the form of the linguistic study of signed languages, provided a key element in the evolving theory.

A common theme running through gestural theories of the origin of language is that iconic visible gesture is more natural than speech as a communication device and that it solves the problem of accounting for the origin of completely arbitrary vocal signs. Perhaps there was a stage in the evolution of language when signs were simply iconic and pantomimic illustrations of the things they referred to. Then, one could imagine a stage during which incidental vocal sounds, especially those that were also iconic or onomatopoeic themselves, came to be associated in a gestural complex with the visible sign and the object in the world that was being referred to. Subsequent to this stage, the visible sign could wither away or come to be used as a visual adjunct to the now-predominant spoken word. Other elements have entered the basic argument from findings accumulating in paleoanthropology, primatology, neurology, and linguistics, including the following: the apparently late appearance in human evolution of a fully modern vocal tract and the early appearance of fully modern upper extremities; the apparently greater facility for language-like behavior by apes in the visible or gestural, as opposed to the vocal, medium; the discovery of gesturally responsive mirror neurons in the Broca's-area homologue in the brains of monkeys; and the working out of the linguistic structures of signed languages of the deaf (and especially in this regard, Stokoe's notion of semantic phonology).[1] These elements of an evolving theory will be introduced in this chapter and placed in historical context.

The history of the recorded speculation about the possible gestural origin of language has been treated exhaustively by Gordon Hewes, and it is not the purpose of the current discussion to review it in detail; interested readers are directed to Hewes's work and to discussions by the current author.[2] Our real historical journey begins with the speculations of the French Enlightenment philosophes of the latter half of the eighteenth century, such as Condillac, Diderot, and Rousseau. Some of these writers were aware of the work of teachers of the deaf such as Pereire, and there appears to have been feedback between the philosophes and the Abbé de l'Epée, who opened the first school for the deaf in France in the late eighteenth century, as the theories of deaf education and of the origin of language evolved in tandem.[3] As Sophia Rosenfeld points out, these French Enlightenment thinkers were motivated as much by a political agenda as by an interest in science.[4] They saw signed language as more natural and transparent than speech and, hence, less capable of corruption and manipulation by the ruling class. They also questioned whether it could be used for truly abstract thinking and discourse.[5]

Speculation about the nature of the first human languages became joined with the idea that the human species might have a long evolutionary history soon after the publication of Darwin's *Origin of Species* in 1859. There was an active—one might even use the adjective *rampant*—period of speculation that apparently developed into such an annoyance to the Linguistic Society of Paris that it banned

the presentation of papers on the subject of the origin of language in 1866.[6] According to Adam Kendon, the London Philological Society followed suit in 1872.[7] Thus began a century during which speculation on the origin of language in general fell increasingly into disrepute among serious scholars. A further serious blow to the idea of a gestural origin for language came in 1880 with the adoption, at a congress on education of the deaf in Milan, of a recommendation that the instruction of deaf students in sign language be discontinued in favor of oral-only instruction. Not only was this a watershed event in the education of deaf children, to be followed by a century in which signed languages were suppressed in schools in Europe and the Americas, but it also signaled a general devaluation of and decline in the intellectual status of signed languages and an end to serious scholarly study of their characteristics.[8]

We can date the reawakening of serious scientific and scholarly study of the origin of language to two seminal conferences: a symposium at the 1972 meeting of the American Anthropological Association and a subsequent conference hosted by the New York Academy of Sciences in 1975.[9] As was mentioned earlier, the impetus for this reawakening seems to have been the increasing evidence that could be brought to bear on the subject from paleoanthropology, primatology, neurology, neurolinguistics, and, of particular significance for this discussion, sign-language studies.[10]

What is perhaps most evident is that early speculation about language origins following Darwin was severely constrained by a lack of fossil evidence for human evolution. At the time of the Paris Society's ban, paleoanthropological knowledge was limited essentially to a skullcap from the Neander Valley (Neanderthal) of Germany, and a few other European fragments, of an extinct, relatively recent hominid that is now thought possibly not to be a direct ancestor of modern humans. The first finds of the more ancient *Homo erectus* did not come until the 1890s, in Java, and those of the still more ancient australopithecines of southern Africa, not until the 1920s. Making matters of interpretation more difficult during the first half of the twentieth century was the "discovery" of the infamous Piltdown forgery, of 1908–13, which presented a picture almost diametrically opposed to that which could be inferred from the *erectus* and australopithecine material. The fraud was not completely exposed until 1953. Discoveries of fossil humans in Africa, Europe, Asia, and Indonesia have come with increasing frequency in the post–World War II era, so that now a fairly coherent story of the course of human anatomical evolution can be pieced together.

During the same postwar period, especially beginning in the 1960s, primatologists from the English-speaking world and Japan were compiling a detailed body of information about the behavior, in the wild and in captivity, of the African apes: gorillas, chimpanzees, and bonobos, undoubtedly the closest living relatives of modern *Homo sapiens*, separated from us by what is now known to be a very modest genetic divide.[11] Current attempts to make inferences about the possible

language-like behavior of early hominids depend upon a sort of triangulation from the fossil evidence for anatomical characteristics of the various fossil hominids (especially regarding what these might imply about behavior) and what is known about the anatomy and behavior of modern apes contrasted with the same characteristics of modern humans. Whatever can be inferred through this process of triangulation can be said to be the only empirical evidence bearing on the origin and evolution of the human capacity for language prior to the invention of writing, about five thousand years ago. Which is to say that prior to the written representation of languages on permanent media, there is no direct, irrefutable evidence that human beings even had languages; scenarios about language prior to that invention are all based on inference and speculation from the fossil evidence and primatological studies leavened with inferences from what might be referred to as philosophical assumptions.

Finally, beginning in the mid-1950s with the work of William C. Stokoe at Gallaudet University, there was a growing movement to recognize (or re-recognize) the signed languages of deaf people as bona fide human languages, something, as we have seen, that had been generally denied since the late nineteenth century. Other significant early work on sign-language linguistics began in the 1970s at the Salk Institute.[12] It is worth noting here that, in addition to putting forth the first relatively complete description of a signed language—what came to be known as American Sign Language (ASL) in modern linguistic terms[13]—Stokoe was also one of the earliest participants in the revival of language-origins studies; he was present at both the 1972 and 1975 conferences mentioned earlier. Along with Gordon Hewes, he proposed a revival of the gestural-origin theory coincident with the resuscitation of the field of language origins in general, supported by the new evidence concerning the linguistic structure of signed languages.

Almost from the outset of publication of the early linguistic studies by Stokoe, it occurred to primate-behavioral researchers that language training with apes that involved signed language might prove more fruitful than the largely failed experiments with speech that had been attempted up to that time. The psychologists Allen and Beatrice Gardner were the first to make major claims of success in this endeavor with the chimpanzee Washoe in the early 1970s.[14] Washoe and other chimps raised in a sign-language environment by the Gardners were said to be capable of acquiring and appropriately using an extensive vocabulary of signs and of combining them into simple phrases.[15] It is easy to see why language-origins theorists would find this research to be of exceptional importance. If chimpanzees and gorillas are able to produce and comprehend significant aspects of a human language, then it is reasonable to infer that a common ancestor also possessed these capabilities. And, if those capabilities are evident with respect to signed language and not speech, then the gestural hypothesis is strongly reinforced. Notably, this argument is thought to be undermined by the fact that it took human intervention for these apes to use signs. However, evolutionary arguments generally

depend heavily on the idea that unused capacity, sometimes called "preadaptation," becomes expressed and then is selected for under appropriate environmental conditions.

Controversy about the meaning of this ape-language research arose fairly quickly. A major challenge to the Gardners came from Herbert Terrace and the Nim project.[16] Charges and countercharges followed as to the question of whether apes can be said to refer symbolically, to have grammar or protogrammar, and so on.[17] Terrace, in particular, challenged the notion that chimpanzees might be capable of using a sort of grammar. Some deaf people knowledgeable about these studies were not necessarily convinced that ASL was really being produced.[18] Nor could one expect that what the apes produced would be flawless human signing; they have, for example, hands that are quite unlike those of humans in several critical respects—but it is not my purpose here to dissect this research.

What one makes of the fossil and primatological evidence tends to depend on which of two fundamentally different models of the nature of language one adheres to. I have previously characterized these fundamental approaches as Chomskyan versus Whorfian,[19] and I would now characterize the distinction as generativist versus cognitivist, but I want to stress at least a connection in spirit if not in actual tradition between earlier relativistic anthropological linguistics and the current cognitive movement. It seems fair to say that the generativist school of linguistics has tended to see a greater gulf between humans and apes, that is, primarily discontinuity in evolutionary terms, whereas cognitivists and the more anthropologically oriented have tended to see what commonalities there are as indicative of evolutionary continuity. I will discuss what this evidence might suggest about the evolution of the human capacity for language, but first it will be instructive to digress on the subject of the linguistic status of the signed languages of the deaf, and the political controversy that has surrounded that topic.

When Stokoe set out to show that what came to be known as American Sign Language had what qualified as a linguistic structure, he recognized the need to overcome almost a century of prejudice against sign languages that had been used to educate deaf children and that had subsequently been suppressed. Signed languages had been derogated as "ideographic" and "mimetic," rather than abstract and symbolic. In order to undermine notions such as these, Stokoe employed the tools of traditional structural linguistics, devising a system for phonological notation, based on the idea of sublexical contrast, that was a visual analogue, in three dimensions, of the systems in use to describe the phonological structures of spoken languages. During the 1970s and 1980s, a large body of research was produced concerning ASL and, increasingly, other signed languages as well.[20] Many sign linguists during this time saw what Sherman Wilcox has called "the specter of iconicity" as a major obstacle on the road to recognition of sign languages as legitimate human languages.[21]

It is not hard to see how claims that chimpanzees and gorillas could learn ASL

might work to the advantage of those trying to deny linguistic status to signed languages by claiming that they were primitive. According to Sarah Taub, "For a long time, the doctrine of the 'arbitrariness of the sign,' attributed to de Saussure has held sway in linguistics. . . . [S]ymbolic forms, no longer restricted by the need to physically resemble their referents, are what allow us to talk about everything from amnesia to ethics. . . . According to this view, iconic forms are limited to playacting, imitations, and the rare onomatopoeic word, and their meanings can never be sophisticated or abstract in any way."[22] Given this sort of bias among linguists, and, perhaps, the general public, it was natural that the linguistic study of signed language would begin with attempts to show that the abstract and arbitrary features of phonology and syntax could be discovered and described in signed languages just as they had been for spoken languages. Beginning with Stokoe, this is just what the linguists studying these languages attempted to do.[23] Although the existence of iconicity was noted, it is arguable that most linguists were more interested in explaining it away than in treating it as fundamental.

Denial of iconicity came at an intellectual cost—what has been called the procrustean bed approach—lopping off whatever doesn't fit the received theory.[24] The political goal of establishing the legitimacy of signed languages arguably benefited from a symbiotic alliance with the Chomskyan generativist/nativist school. The nativist linguistic approach could support the idea of signed languages as simply further evidence for universal linguistic principles being deployed in a radically different sensory medium. In particular, there were claims that signed languages were, at most, minimally iconic, and that they had organizational principles virtually identical to those of spoken languages. For example, it was assumed that an abstract phonology could be developed, and it was assumed that unmotivated syntactic rules could be identified. An early claim that ASL grammar might be at least partly analogue caused considerable controversy.[25] But the fundamentally iconic underpinnings of sign languages would not go away and could not be explained away. More recently, the cognitive movement in linguistics has started to restore to sign languages acknowledgment of their iconic and indexic richness.[26] Cognitive linguists argue, in fact, that signed languages like ASL retained much of their gestural quality even as they evolved into full-fledged human languages. In this regard, Scott Liddell, in particular, has pioneered the notion that sign-language utterances involve blends of linguistically and gesturally organized elements—that is, both digital and analogue components.[27]

A key argument in support of a genetically determined grammar module, in humans but not in apes, is that all human languages, in whatever medium (signed or spoken), depend upon abstract syntactic rules that are independent of the meanings of the language's words. Taub shows clearly that this cannot be true of at least one signed language (ASL) and presumably others. Taub focuses on the rules for selection of particular iconic forms from the range of options that presents itself in any given situation.[28] She derives rules governing this sort of choice,

especially with respect to verb paths. Unlike most previous analysts, Taub argues that the paths taken by a category of ASL verbs labeled "agreement verbs" are ultimately motivated by semantic considerations and not by the rules of formal grammar, for example, movement from subject to object. In this regard, in fact, agreement verbs would seem to be fairly obviously iconically motivated. For example, the movement of the ASL sign GIVE is from the giver to the receiver, representing in a straightforward manner the transfer of an object from one owner to another.

Taub provides a framework for dealing with a class of agreement verbs in which the underlying motivation is more complex, a class that has been referred to as "backward verbs." These are verbs in which movement is toward the subject, verbs such as STEAL, TAKE, and BORROW, and their action is obviously not explained by an arbitrary grammatical rule that specifies movement from subjects toward objects. Taub shows conclusively that only a semantic analysis involving iconic and metaphorical pathways provides a satisfactory explanation for the behavior of these and other verbs that involve multiple possible pathways. Taub shows that, in general, ASL has a hierarchical structure for the selection of possible pathways. In the case of agreement verbs, the movement of an actual or metaphorical object from its source to its goal generally determines the course of actual movement of the verb. In cases where there might be a potential conflict between possible paths, a hierarchical set of rules determines which path is chosen.

This example provides an illustration: there are two signs (or sentences) in ASL with very similar meanings having to do with the gathering of visual information and glossed as "I-LOOK-(AT)-HIM/HER/IT" and "I-PERCEIVE-BY-EYES-HIM/HER/IT." They differ with respect to the direction of action of the signs; in the former, the path is from the subject toward the object being viewed, and in the latter the action is toward the subject. The difference in meaning is what might be expected given the iconic and metaphorical underpinnings of the two utterances. As Taub puts it, the "verbs profile slightly different parts of the [semantic] frame." In LOOK, the energy is directed outward, and in PERCEIVE-BY-EYES, what is profiled is what the viewer "gets from" the picture—metaphorically, something is taken into the eyes. The direction of motion of the verbs can be predicted only from the meanings of the signs, not by an abstract grammatical rule.[29]

Why is this important here? Because of the symbiotic political relationship between early sign-language research and the Chomskyan linguistic approach, the postulated structural identity between signed and spoken languages was taken as supportive of the notion that human beings have genetically instantiated grammar modules in their brains,[30] which apes are assumed not to have. Instead of supporting the idea of a special grammar module, I would argue that the new, richer analyses of signed languages that are now emerging are tending to undermine it. Ultimately, if we are interested in the biological evolution of our species, we will want to know just what it is that humans have actually acquired genetically if

we are to understand their evolution from a generalized ape "platform." If there is no such grammar module, then there is nothing to account for at this level of specificity, and a more general increment in cognitive flexibility may be all that is needed. The controversy over the meaning of ape-language research also highlights the difficulty in distinguishing language from nonlanguage. For example, if arbitrariness of the linguistic sign is a prerequisite, if language is required to be a completely abstract code, then a large proportion of what deaf people do when they sign to each other may not qualify. At bottom, this appears to be an unproductive debate, and more nuanced interpretations have begun to emerge with fine-grained observation of actual ape gestural behavior.[31]

One thing is abundantly clear: we share with apes an extremely rich and flexible social life that is mediated by visible gestures and vocalizations, and it is possible to see commonalities in social life between apes and modern human societies that employ relatively uncomplicated technologies, the so-called hunter-gatherers.[32] All human beings lived in this manner for much of their existence as a separate lineage—that is, in small groups without permanent settlements and without control of the resources supporting their survival.

We are only now beginning to learn how apes actually communicate through the pioneering work of researchers such as Barbara King, working with gorillas in a zoo setting. Sadly, this research with apes will increasingly have to be done in zoos, because of the growing threat to their viability in natural settings in Africa. With respect to the principal thesis being advanced here, it is worth repeating what King has to say about the gestural behavior of apes under captive conditions: "The studies by [Sue] Savage-Rumbaugh and colleagues and [Joanne] Tanner and [Richard] Byrne, then, demonstrate co-regulated gestural communication in African apes, and suggest iconicity in their gestures."[33] King goes on to point out, commenting on whether such "iconic" gestures are really iconic from the point of view of the apes themselves or only from that of human observers, that what really matters is how the apes use these gestures to regulate their social life. In the final analysis, this issue is not fundamentally different from that of the significance of the iconicity in signed languages that was discussed earlier: following conventionalization of the sign, the signer may not have conscious access to its original iconicity.

This work is critical because, as I have indicated, it is clear that humans and apes share a fundamental adaptation to cooperative social life. Human beings have certainly become increasingly dependent on technology, but there is little doubt that for most of their history they relied fundamentally on their ability to organize for productive activity more than they relied on tools. For example, the highly successful and morphologically diverse australopithecines left virtually no evidence of technology of any sort during their two million years or more on planet Earth. So, if we are going to look for the roots of language, we would be highly advised to look at the social communication of the African apes, and especially at their use of gestural communication in the visual modality.

Having thus set the historical stage, I will now discuss a scenario for the origin of language that I think the preponderance of the current evidence supports, along the lines of that first presented by Stokoe, Wilcox, and me in 1995 and extended by Wilcox and me in 2007.[34] There are three lines of evidence to be explored. The first of these provides the only really direct evidence for the origin of language: inferences about behavior from the human fossil and archaeological record. The second involves inferences from the behavior and comparative neurology of modern apes and humans, and the third could be called philosophical or speculative in nature, what could be gained theoretically by adopting a particular theoretical stance—in this case, what problems in the study of language origins would be solved if we adopted the gestural-origins hypothesis?

The fossil evidence for human evolution has grown substantially but is still limited. What there is suggests several relevant conclusions. First, it is incipient bipedal locomotion that defines the hominid lineage; bipedalism, for example, emerges before brain expansion begins, freeing the hands for, among other activities, gestural communication. Second, the human hand reached its modern configuration relatively early, at least with *Homo erectus*. Third, the appearance of the modern vocal tract, as inferred from flexion of the basicranium, came relatively late, reaching fully modern form perhaps only with the emergence of anatomically modern *Homo sapiens*.[35]

Next, study of the behavior of modern nonhuman primates suggests greater limitations on vocal flexibility than on gesture, although the issue may be open to debate.[36] Furthermore, there is now considerable relevant evidence from the study of primate comparative neurology. Of particular interest here is the discovery of what have come to be known as mirror neurons in areas of the frontal cortex (F5) of monkeys that appear to be homologous with Broca's area in humans. These are neurons that are activated when a monkey performs a specific manual action and also when the monkey observes another making the same gesture. Giacomo Rizzolatti and Michael Arbib relate these neurons specifically to the gestural-origin hypothesis: "[(1)] . . . [T]he mimetic capacity inherent to F5 and Broca's area had the potential to produce various types of closed systems related to the different types of motor fields present in that area (hand, mouth and larynx); (2) the first open system to evolve *en route* to human speech was a manual gestural system that exploited the observation and execution matching system described earlier; and (3) that this paved the way for the evolution of the open vocalization system we know as speech."[37] Further support for a gestural origin of language comes from research on the genetic basis of the human speech/language complex, specifically with respect to the FOXP2 gene.

A genetic disorder at first said to affect only grammatical processing[38] and later shown to affect other aspects of spoken language, including movements of the facial and oral musculature,[39] has been linked to a regulatory gene called FOXP2.[40] It has been shown that this gene has undergone relatively extensive evolution in

the hominid lineage since its split with chimpanzees and that, in particular, a mutation that favored articulate speech was probably fixed in the human population as recently as only one hundred thousand to two hundred thousand years ago, or perhaps coincident with the appearance of modern *Homo sapiens*.[41] A reasonable interpretation of the function of this gene in its modern human form is that it was the final piece in a genetic mosaic that made articulate speech efficient and usable as the primary channel for human language. Because the brain had already achieved its modern size and form by this time, it is also reasonable to propose that well-developed sign languages had already been in use well before this, and that the human FOXP2 mutation simply enabled a shift to speech. Also of interest here, and to be discussed in more detail subsequently, is a theory that accounts for the relationship in modern humans of cerebral asymmetry for language and handedness, and for what the appearance of such asymmetry (or lack of it) in apes has to do with the gestural-origins hypothesis.

Michael Corballis has presented a comprehensive review of gestural-origins theory, including much of the evidence adduced here, as well as an innovative approach to an enduring question concerning human cerebral asymmetry.[42] There has been no lack of speculation about the ontogeny and phylogeny of human cerebral lateralization. However, the arguments for why handedness and lateralization for speech production and perception should both be associated with the left cerebral hemisphere have been less than convincing. The lateralization of language functions is often thought of as a uniquely human trait, but as Corballis points out, lateralization for vocalization is far from unique; in fact, it is quite common in the animal kingdom. What probably is unique is the consistent, population-level (primarily right-) handedness seen in human beings. Corballis's innovation is the assertion that the initial step was the introduction of a gesture-based language, followed by the recruitment of vocalization by a developing gesture–language capability. If there is some inherent tendency for vocal functions to be lateralized to the left side of the brain, then as speech came to predominate, it could have influenced the development of handedness first for gesture, later more globally.

Finally, we come to what I referred to earlier as philosophical speculation in support of the gestural hypothesis, taking a cognitivist point of view. Here, I want to introduce the concept of semantic phonology originally proposed by Stokoe as a way to explore the nature of the elementary building blocks of signs.[43] By the late 1980s, Stokoe had become concerned that the phonological system he had originally introduced to deal with the production of signs in three dimensions had transmogrified into a complex nightmare as linguists attempted to force the underlying iconic and indexic qualities of signed languages into abstract grammatical formulas. Stokoe's solution to the problem was to embrace the iconicity rather than deny it. What he proposed, in effect, was that it might be more productive to describe signs as elementary semantic/syntactic units rather than to try to analyze out the phonological, syntactic, and semantic levels generally employed in

the description of spoken languages. He described the ASL sign glossed GRASP or SEIZE to illustrate the point. This sign is made by the open dominant hand sweeping in front of the signer's chest and closing around the upraised index finger of the other hand—it literally illustrates the action of grasping. Stokoe's approach was to think of this as a minitransitive sentence with subject, verb, and direct object. Such minigrammatical units could then be used as building blocks for more complex sentences—they could thus be seen as immediately leading to a form of recursion. Much of what happens in sign languages is simultaneous. In the "grasp" gesture, the dominant hand (subject) is always present as the movement (verb) occurs, as is the upraised nondominant index finger (direct object). Also present during the production of a sign is simultaneous use of facial and other bodily gestures that may modify the meaning of a manual sign.

Although Chomsky is now willing to consider some aspects of linguistic behavior as having discernible evolutionary relationships to behaviors evident in nonhuman primates, he still holds out for the uniqueness of human recursive ability—the basis of syntax—and a lack of real evolutionary history for it. In particular, Marc Hauser, Chomsky, and W. Tecumseh Fitch assume that human recursive abilities might originally have had a function in something other than communication.[44] However, Stokoe, Wilcox, and I have used the notion of semantic phonology to explain how syntax might have originated among hominids using inherently recursive iconic gestures in increasingly complex systems.[45] It can be seen that this proposal solves the chicken-and-egg problem that syntax becomes if we follow the structural and then the generative linguistic notions of levels. In this formulation, as Stokoe has put it, "The usual way of conceiving of the structure of language is linear: First there are the sounds (phonology), these are put together to make the words and their classes (morphology), the words in turn are found to be of various classes, and these are used to form phrase structures (syntax), and finally, the phrase structures, after lexical replacement of their symbols, yield meaning (semantics). A semantic phonology ties the last step to the first, making a seamless circuit of this progression. The metaphor for semantic phonology that jumps to mind is the Möbius strip: the input is the output, with a twist."[46] Ray Jackendoff recognizes the problem that these levels, parameters, or components of analysis pose for a theory of language origins, especially when that theory is excessively, as he puts it, "syntactocentric":

> In the syntactocentric architecture, everything depends on syntax. Meaning cannot have evolved before syntax, because its structure is totally dependent on the syntactic structure from which it is derived. For the same reason, phonological structure cannot have evolved before syntax. Thus the complexity of syntax had to evolve before the complexity of the other components. But what would confer an adaptive advantage on a syntactic faculty that just generated meaningless and imperceptible syntactic

> structures? And what would enable children to acquire such syntactic structures if there were no perceptible output to which they could attach it? We quickly see that, at this very crude level at least, the syntactocentric theory is stuck: there is no logical way to build it incrementally, such that the earlier stages are useful.[47]

Jackendoff's solution to the problem is to introduce "parallel architecture": three generative systems—phonological, semantic, and syntactic—evolving simultaneously with interface components. It is suggested here that the argument from semantic phonology renders unnecessary such a complex architecture.

A basic question that emerges from all of the foregoing examples can be stated quite simply: in the search for the roots of language, do we rule language-like behavior in or do we rule it out? There certainly must be aspects of modern human behavior that have no homologues in the behavioral capacities of the African apes and the genetic underpinnings of which must have arisen after the split with the human lineage. There are also many ways in which the signed languages of the deaf are equivalent to spoken languages, especially at the level of function. However, if we are really interested in the best possible reconstruction of the behavioral capacities of early hominids, then we will want to know as much as we possibly can about the behavioral capacities of African apes and about the ways in which modern human beings actually construct their languages in the various media, especially the visual media, that are open to them. To have stated twenty years ago or to state now, as some have done and some continue to do, that African apes are known to lack such-or-such capability or that the signed languages of the deaf are either primitive or precisely identical in structure to spoken languages is to offer a counsel of ignorance. What is clear is that Deaf Gain has contributed hugely to our understanding of these fundamental issues and that much remains to be discovered.

Deaf Gain and the Evolution of Modern Visual Culture

With a revolution under way in the ability of human beings to communicate at a distance in real time through the visual medium, investigation of Deaf Gain has the potential to influence the productive use of the new communication technologies. If Deaf Gain is the conceptual opposite of "hearing loss," we can ask what the Deaf experience of many centuries has contributed to the sum of useful knowledge about the capacity to communicate using the visual medium. This investigation can be fit into an evolutionary framework not only at the biological level, as we have seen, but also at the cultural level. The fundamental problem in the study of evolution in general is to show how a species has overcome the second law of thermodynamics—the law that states that entropy or disorganization is always increasing in a physical system. The American reformer Sylvester Graham stated this principle, with respect to living systems, most succinctly and aptly in

1854: "From the commencement to the termination of the vital existence of organized bodies, therefore, life maintains a continual conflict with opposing forces: and hence it has with beauty and propriety been said, 'that life is a forced state'—'a temporary victory over the causes which induce death.'"[48] Five years later, in 1859, Darwin described the biological process, natural selection of genetically more fit individuals, by which this organization is introduced and sustained.

As the members of species reproduce themselves through successive generations, they are constantly overcoming entropy. The answer to how they are able to do this is an evolutionary process, whereby energy input can lead to the extraction, coding, storage, and eventual decoding of information within the system. The process can have a fundamentally random basis, as in genetic mutation, but there must be a process for identifying and storing random bits of potentially useful information. In a biological system, this occurs through the process of natural selection—a very slow process, as it depends on the random production of advantageous genetic mutations and the propagation and storage of these mutations across many generations, within specific environmental niches.

Human cultures can greatly expedite this process, especially when they are able to use languages, because the introduction of new elements no longer needs to be entirely random; it can be purposeful and goal directed, necessity being the mother of invention. Within this framework, we can see language as primarily a mechanism for encoding useful information and, prior to the invention of writing, for storing it within the collective heads of a community for retrieval and transmission to future generations. Part of the beauty of this system is that language allows for a division of labor with respect to the storage of parts of the collective pool of information. Different members of the community can remember different pieces of what is useful to know about the social structure and physical environment of the community of language users. This is a partial explanation (sometimes called the grandmother hypothesis) for the tendency of human societies to preserve their elders, especially women, well beyond the end of their reproductive years, a challenge for a purely biological evolutionary theory that entails the propagation of genetic changes that result in the enhancement of reproductive success. The longer a person lives, the more diverse will be the life experiences that person can remember and retrieve for application to future events.

Writing about the accelerating process by which many of the world's languages are becoming extinct, K. David Harrison comments on this biological/linguistic comparison as follows:

> Extending the biological metaphor, language disappearance only superficially resembles species extinction. Animal species are complex, have evolved over long periods of time, possess unique traits, and have adapted to a specific ecological niche. An extinct dodo bird can be stuffed by taxidermists and displayed in a museum after all its kind are dead and gone. But

> a stuffed dodo is no substitute for a thriving dodo population. Languages, too, have adapted over time to serve the needs of a particular population in their environment. They have been shaped by people to serve as repositories for cultural knowledge, efficiently packaged and readily transmittable across generations.[49]

Although it is evident that many of world's sign languages are endangered similarly to the dodo bird, that issue will not be a topic of this chapter. The case for their continuing value and for preserving them has been made elsewhere[50] and is assumed to be obvious within the context of a discussion of Deaf Gain.

A major point to be made about Deaf Gain is that it represents the experience of signing Deaf communities that has been collected and stored over many generations and coded for future extraction in signed languages. So, the reading out of this experience tells us much about how human beings might communicate optimally in a primarily visual medium. It is at this point that we might want to separate ourselves from the Chomskyan-universalist theories of language; the added value of Deaf Gain is precisely what is different about the ways in which sign languages are constructed as contrasted with speech, not the ways in which they are the same. There is a caveat related to that observation, of course, as the face-to-face communication of deaf people is constrained by the functional limitations of the human musculoskeletal system, but the "gain" in potential information from reading out this evolved system is huge. This is true of the reading out of the genome of any biological species, or the reading out of any human language and culture. However, the reading out of the Deaf Gain is a particularly valuable commodity at this particular point in human technological history.

In this regard, it must be noted that the linguistic treatment of ASL and other sign languages during the latter half of the twentieth century may have had unintended consequences. As we have seen, part of the program for gaining acceptance of sign languages as bona fide human languages involved adopting the Chomskyan paradigm that they were simply expressions of the universal grammar expressed in a different medium—that their formal structures were dictated, in effect, by a genetically determined language organ in the brain, essentially replicated in each human being. If this were true, a number of conclusions about sign languages and about their use by deaf people should follow.

First, if sign languages were essentially the same as spoken languages, it should be relatively easy to invent signed surrogates for spoken languages. However, the history of deaf education since the late nineteenth century, when natural sign languages were banished from most classrooms worldwide, suggests otherwise. When signing was reintroduced into many educational systems during the latter half of the twentieth century, it tended to be modeled on the dominant spoken language of the country or community. Deaf people have stubbornly resisted efforts to impose signed surrogates for speech, such as signed English, for use in

education. What has been attempted through these surrogates is to replicate all of the grammatical features of a spoken language by introducing signed grammatical particles, such as articles, that are absent in sign languages. These surrogates also generally ignore the essential spatial and movement features of signing, which are inherently iconic and indexic.

Second, other systems designed to replicate directly the phonological structures of spoken languages have also not been notably successful in winning support from deaf people. These systems include finger-spelling all the words of a spoken-language utterance, as in the so-called Rochester method, or disambiguating the lip movements of speech by adding manual cues to the speech stream, as in the method called Cued Speech. It should be clear that, if there were a phonological module in the brain cranking out abstract rules of assembly, then signed languages should in some respects be like finger spelling, composed of strings of nicely segmented, arbitrary phonological symbols. However, we know that this is not the case in natural sign languages; they are very stubbornly iconic and will be as iconic as they can be, subject to restraints on what can be presented through direct representation by visible body parts, especially the hands, and on the need for economy in production.

We can note one final possible unintended consequence of the assertion that all languages are simply the expression of innately determined rules for production and decoding: proper credit for their invention may not be accruing to their inventors. In a recent ethnography of the French deaf community, Yves Delaporte points out, as we have already seen, that early linguistic descriptions of ASL, beginning in the 1960s, tended to minimize or deny the role of iconicity in signed languages because of the general prejudice against "mimicry" and "pantomime" as primitive forms of communication.[51] Happily, the linguistic study of sign languages has matured, at least in France and the United States,[52] to the point that major works are now appearing that explicitly (and sometimes triumphantly) describe the grammatical processes of these languages in their own metaphorical, gestural, indexic, and iconic terms and that do justice to the creativity and resourcefulness of the people who create and use them, rather than simply attributing them to a genetically induced language organ. To the extent that what is learned from the study of Deaf Gain is applied to the study of visual communication generally and to the design and construction of new communication technologies, Deaf people deserve credit for, if not some degree of ownership in, this rapidly increasing store of intellectual capital.

Notes

Portions of this chapter are adapted from work the author previously published in the journal *Sign Language Studies* and in his book *Show of Hands: A Natural History of Sign Language,* both published by Gallaudet University Press.

1. D. F. Armstrong, "Scientific and Ethical Issues in the Case for American Sign Language," *Sign Language Studies* 43 (1984): 165–84.

2. See G. W. Hewes, "Primate Communication and the Gestural Origin of Language," *Current Anthropology* 14 (1973): 5–24; G. W. Hewes, "The Current Status of the Gestural Theory of Language Origins," *Annals of the New York Academy of Sciences* 280 (1976): 482–504; G. W. Hewes, "A History of the Study of Language Origins and the Gestural Primacy Hypothesis," in *Handbook of Human Symbolic Evolution,* ed. A. Lock and C. R. Peters (Oxford: Clarendon, 1996), 571–95; D. F. Armstrong, *Original Signs: Gesture, Sign, and the Sources of Language* (Washington, D.C.: Gallaudet University Press, 1999); and D. F. Armstrong and S. Wilcox, "The Origins of Sign Language," in *Oxford Handbook of Deaf Studies, Language, and Education,* ed. M. Marschark and P. Spencer (New York: Oxford University Press, 2003), 305–18.
3. H. Lang, "Perspectives on the History of Deaf Education," in Marschark and Spencer, *Oxford Handbook of Deaf Studies, Language, and Education,* 9–20.
4. S. Rosenfeld, *A Revolution in Language: The Problem of Signs in Late Eighteenth-Century France* (Stanford: Stanford University Press, 2001).
5. Hewes, "The Current Status of the Gestural Theory of Language Origins," 483–84.
6. Hewes, "A History of the Study of Language Origins and the Gestural Primacy Hypothesis."
7. A. Kendon, "Historical Observations on the Relationship between Research on Sign Languages and Language Origins Theory," in *The Study of Signed Languages: Essays in Honor of William C. Stokoe,* ed. D. F. Armstrong, M. A. Karchmer, and J. V. Van Cleve (Washington, D.C.: Gallaudet University Press, 2002), 13–34.
8. D. Baynton, "The Curious Death of Sign Language Studies in the Nineteenth Century," in Armstrong, Karchmer, and Van Cleve, *The Study of Signed Languages.*
9. See R. Wescott, *Language Origins* (Silver Spring, Md.: Linstok, 1974); and S. R. Harnad, H. D. Steklis, and J. Lancaster, eds., "Origins and Evolution of Language and Speech," special issue of *Annals of the New York Academy of Sciences* 280 (1976).
10. W. C. Stokoe, *Sign Language Structure: An Outline of the Visual Communication Systems of the American Deaf,* Studies in Linguistics: Occasional Papers 8 (Buffalo, N.Y.: Dept. of Anthropology and Linguistics, University of Buffalo, 1960).
11. J. Goodall, "Chimpanzees of the Gombe Stream Reserve," in *Primate Behavior: Field Studies of Monkeys and Apes*, ed. I. DeVore (New York: Holt, Rinehart & Winston, 1965); G. Schaller, "The Behavior of the Mountain Gorilla," in DeVore, *Primate Behavior;* V. Reynolds, "Some Behavioral Comparisons between the Chimpanzee and the Mountain Gorilla in the Wild," *American Anthropologist* 67 (1965): 691–705; A. Suzuki, "An Ecological Study of Chimpanzees in a Savanna Woodland," *Primates* 10 (1969): 197–225.
12. E. Klima and U. Bellugi, *The Signs of Language* (Cambridge, Mass.: Harvard University Press, 1979).
13. Stokoe, *Sign Language Structure;* W. C. Stokoe, D. C. Casterline, and C. G. Croneberg, *A Dictionary of American Sign Language on Linguistic Principles* (Washington, D.C.: Gallaudet College Press, 1965).
14. This work is summarized in R. E. Gardner, B. T. Gardner, and T. E. Van Cantfort, eds., *Teaching Sign Language to Chimpanzees* (Albany: State University of New York Press, 1989).
15. R. E. Gardner, B. T. Gardner, and S. G. Nichols, "The Shapes and Uses of Signs in a Cross-Fostering Laboratory," in Gardner, Gardner, and Van Cantfort, *Teaching Sign Language to Chimpanzees,* 55–180.
16. H. S. Terrace et al., "Can an Ape Create a Sentence?," *Science* 206 (1979): 891–900.
17. J. Wallman, *Aping Language* (New York: Cambridge University Press, 1992); Gardner, Gardner, and Van Cantfort, *Teaching Sign Language to Chimpanzees;* D. Premack, *Gavagai! or, The Future History of the Animal Language Controversy* (Cambridge, Mass.: MIT Press, 1986); S. Pinker, *The Language Instinct* (New York: Morrow, 1994); R. Fouts and S. T. Mills, *Next of Kin* (New York: Morrow, 1997).

18. A. Neisser, *The Other Side of Silence* (New York: Knopf, 1983).
19. Armstrong, *Original Signs,* 47.
20. W. C. Stokoe and V. Volterra, eds., *Proceedings of the Third International Symposium on Sign Language Research* (Silver Spring, Md.: Linstok, 1985); R. Wilbur, *American Sign Language: Linguistic and Applied Dimensions* (Boston: Little, Brown, 1987).
21. S. Wilcox, "Hands and Bodies, Minds and Souls: or, How a Sign Linguist Learned to Stop Worrying and Love Gesture" (paper presented at the Workshop on the Integration of Language and Gesture, University of Delaware, Newark, 1996).
22. S. Taub, *Language from the Body: Iconicity and Metaphor in American Sign Language* (New York: Cambridge University Press, 2001), 2.
23. Stokoe, *Sign Language Structure.*
24. Armstrong, "Scientific and Ethical Issues in the Case for American Sign Language," 179–80.
25. A. De Matteo, "Visual Imagery and Visual Analogues in ASL," in *On the Other Hand*, ed. L. A. Friedman (New York: Academic Press, 1977), 109–36.
26. Taub, *Language from the Body;* P. P. Wilcox, *Metaphor in American Sign Language* (Washington, D.C.: Gallaudet University Press, 2000).
27. S. K. Liddell, *Grammar, Gesture, and Meaning in American Sign Language* (New York: Cambridge University Press, 2003).
28. Taub, *Language from the Body.*
29. Ibid., 188–89.
30. S. Pinker, *The Language Instinct* (New York: Morrow, 1994), 349.
31. J. E. Tanner and R. W. Byrne, "Representation of Action through Iconic Gesture in a Captive Lowland Gorilla," *Current Anthropology* 37 (1996): 12–73; J. E. Tanner and R. W. Byrne, "The Development of Spontaneous Gestural Communication in a Group of Zoo-Living Lowland Gorillas," in *The Mentalities of Gorillas and Orangutans*, ed. S. T. Parker, R. W. Mitchell, and H. L. Miles (New York: Cambridge University Press, 1999), 211–39; B. J. King, *The Dynamic Dance: Nonvocal Communication in African Great Apes* (Cambridge, Mass.: Harvard University Press, 2004).
32. D. F. Armstrong, W. C. Stokoe, and S. E. Wilcox, *Gesture and the Nature of Language* (Cambridge: Cambridge University Press, 1995).
33. King, *The Dynamic Dance,* 99. The studies King cites are E. S. Savage-Rumbaugh, B. J. Wilkerson, and R. Bakerman, "Spontaneous Gestural Communication among Conspecifics in the Pygmy Chimpanzee (*Pan paniscus*)," in *Progress in Ape Research,* ed. G. H. Bourne (New York: Academic Press, 1977), 91–116; and Tanner and Byrne, "The Development of Spontaneous Gestural Communication in a Group of Zoo-Living Lowland Gorillas."
34. Armstrong, Stokoe, and Wilcox, *Gesture and the Nature of Language;* D. F. Armstrong and S. Wilcox, *The Gestural Origin of Language* (New York: Oxford University Press, 2007).
35. Armstrong and Wilcox, *The Gestural Origin of Language.*
36. B. J. King, "Alternative Pathways for the Evolution of Gesture: Review of M. C. Corballis, *From Hand to Mouth,*" *Sign Language Studies* 4, no. 1 (2003): 68–82.
37. G. Rizzolatti and M. A. Arbib, "Language within Our Grasp," *Neuroscience* 21 (1998): 192.
38. M. Gopnick, "Feature-Blind Grammar and Dysphasia," *Nature* 344 (1990): 715.
39. S. E. Fisher et al., "Localisation of a Gene Implicated in a Severe Speech and Language Disorder," *Nature Genetics* 18 (1998): 168–70.
40. C. S. Lai et al., "A Forkhead-Domain Gene Is Mutated in a Severe Speech and Language Disorder," *Nature* 413 (2001): 519.
41. W. Enard et al., "Molecular Evolution of FOXP2, a Gene Involved in Speech and Language," *Nature* 418 (2002): 869–72.
42. M. C. Corballis, *From Hand to Mouth: The Origins of Language* (Princeton: Princeton University Press, 2002).
43. W. C. Stokoe, "Semantic Phonology," *Sign Language Studies* 71 (1991): 99–106.

44. M. D. Hauser, N. Chomsky, and W. T. Fitch, "The Faculty of Language: What Is It, Who Has It, and How Did It Evolve?" *Science* 298 (2002): 1569–79.
45. Armstrong, Stokoe, and Wilcox, *Gesture and the Nature of Language.*
46. Stokoe, "Semantic Phonology," 112.
47. R. Jackendoff, "Précis of Foundations of Language: Brain, Meaning, Grammar, Evolution," *Behavioral and Brain Sciences* 26, no. 6 (2002): 662.
48. S. Graham, *Lectures on the Science of Human Life* (London: Horsell, 1854), 43.
49. K. D. Harrison, *When Languages Die: The Extinction of the World's Languages and the Erosion of Human Knowledge* (Oxford: Oxford University Press, 2007), Kindle edition, 81–86.
50. T. Johnston, "W(h)ither the Deaf Community? Population, Genetics, and the Future of Australian Sign Language," *American Annals of the Deaf* 148 (2004): 358–75.
51. Y. Delaporte, *Les sourds: C'est comme ça* (Paris: Éditions de la Maison des Sciences de L'Homme, 2002), 327–44. See also Armstrong, *Original Signs,* 65–87.
52. C. Cuxac, *La langue des signes française (LSF): Les voies de l'iconicité,* Faits de Langues 15–16 (Paris: Ophrys, 2000); D. Bouvet, *Le corps et la métaphore dans les langues gestuelles: A la recherche des modes de production des signes* (Paris: L'Harmattan, 1997); Taub, *Language from the Body;* Liddell, *Grammar, Gesture, and Meaning in American Sign Language.*

6

DEAF GAINS IN THE STUDY OF BILINGUALISM AND BILINGUAL EDUCATION

OFELIA GARCÍA AND DEBRA COLE

What does the study of bilingualism and bilingual education gain from Deaf bilingualism and Deaf bilingual education? What does the "languaging" of the Deaf teach all of us about language practices, and especially about the bilingual education of language minorities as well as majorities? What can scholars of bilingualism gain from understanding deafness as an expression of linguistic diversity? What are the gains in understanding bilingualism for the hearing when looking at Deaf bilingualism? This chapter describes how the interactions of a hearing professor (García) and a Deaf doctoral student (Cole) have reshaped the way in which we think about bilingualism in the twenty-first century.

We begin the chapter by positioning ourselves as representatives of diverse bilingual language-minority scholars and educators—one a hearing Latina immigrant, the other a Deaf, white, and American woman. Characterizing our collaboration as that of teacher and student, researcher and researcher's assistant, and author and coauthor describes how our two-year-long collaboration led García to reshape traditional theoretical frameworks about bilingualism and bilingual education. In so doing, the chapter repositions signed languages within the linguistic hierarchy in which spoken languages are traditionally seen as superior. The study of Deaf bilingualism has used theoretical frameworks mainly derived from research on the bilingualism of the hearing. In this case, however, it was studying the bilingualism of the Deaf that led to changes in theoretical frameworks about bilingualism and bilingual education for the hearing. Thus, following the conceptualization of H-Dirksen Bauman and Joseph Murray,[1] this chapter details what we learned about bilingualism and bilingual education from focusing on the practices of the Deaf, beginning with a description of our own experiences of bilingualism as a hearing and a deaf professional, respectively.

Positioning Ourselves

Ofelia García was born in Cuba and, fifty years ago, at the age of eleven, immigrated to New York City. She started school in the United States in the seventh

grade, where she experienced English-only instruction. Because she had attended a private school in Cuba where English was taught in the afternoon, she had some receptive understanding of English. The family moved to a neighborhood where many other Spanish-speaking immigrants lived. Although she quickly developed speaking ability in English through school, she continued to use Spanish at home with family and friends. Upon her entering college, Spanish was still the language of friends and family, but English became the official language of school and the only one in which Ofelia read and wrote. It was in college where she started to recover and develop literacy in Spanish, taking course work in Spanish-language literature. She studied to become a teacher of Spanish as a foreign language and English as a second language, but she started teaching recently arrived Puerto Rican preadolescents in what was then known as Hell's Kitchen. She quickly understood that neither Spanish as a foreign language nor English as a second language was an appropriate program of study for these students. Building on her bilingualism, she started to experiment with bilingual pedagogies even before bilingual education became a formal program of study. Eventually she left the classroom to become a bilingual teacher educator and a scholar of bilingualism. Ofelia's experience with bilingualism as a student, teacher, and teacher educator has always been with two or more spoken languages.

Most of Ofelia's experience with bilingualism was of a spoken majority language, English, and a spoken minority language, Spanish, specifically in the context of the United States. Sometimes, her emphasis focused on developing the English of immigrants who had recently arrived, whether from Puerto Rico, other countries in Latin America, Asia, or Africa. In other cases, the emphasis of her work was on studying the development of the Spanish language and especially Spanish literacy in students who, like Ofelia, had, through the course of high school, begun to shift to English. At yet other times, Ofelia studied the bilingualism of language majorities, as when English-speaking students learned Spanish as a "foreign language." Although she gained extensive experience with international bilingual education, especially during her years as a professor of international education at Columbia University's Teachers College, she remained profoundly ignorant of Deaf bilingualism; that is, until Debra Cole became her doctoral student at Teachers College.

Debra Cole was born in Puerto Rico while her New York City–raised American parents were living there. Upon discovering Debra's deafness, her parents moved back to New York, where they immediately sought the help and advice of professionals. Her parents learned American Sign Language (ASL, which was against many professionals' advice at the time) when Debra was two years old, teaching their daughter ASL in turn. Growing up, Debra saw speech therapists to develop speaking and listening skills in the English language. She subsequently attended an elementary school for the deaf and was mainstreamed with hearing students in

junior high and high school. In essence, Debra grew up bilingual; she used English (both spoken and written) and ASL.

However, English and ASL were not the only languages Debra grew up with. At school, she studied Spanish, Latin, Chinese Sign Language, and Chinese, as well as Italian Sign Language and Italian while living in Italy for two years. Studying foreign languages was a challenge for Debra, mainly because the classes were usually designed with the objective of attaining fluency in both written and spoken aspects—the latter of which did not meet her communicative needs. Based on her experience, she developed a curriculum and established a foreign-language program in which Deaf students could study a foreign language and explore both written- and signed-language practices.[2]

Debra gained extensive formal and academic experience with bilingualism in ASL and English, especially during her years at Gallaudet University. At the same time, she developed an interest in studying the Deaf's acquisition of written languages other than English, and taught English to deaf foreign students in the English Language Institute at Gallaudet. It was her interest in multilingual development and her research in language education for the Deaf in various countries that led her to enroll in a doctoral program in international education development at Teachers College. It was there that she took a course on bilingualism and bilingual education taught by Ofelia.

Deaf–Hearing Collaboration

Ofelia García's course on bilingualism and bilingual education included, up to the time that Debra enrolled in her course, solely readings that addressed spoken languages, and focused mostly on the bilingualism of immigrant minorities. As part of her course, Ofelia used a process for teaching that she calls "collaborative descriptive inquiry," derived from the work of the Prospect Center for Education and Research.[3] Driven by story, image, and detail, descriptive inquiry makes the complexity of academic texts and the lived reality of people more visible.[4] Each participant in the class, including the teacher, takes a turn describing fully why a particular idea or sentence in an academic text is meaningful to him or her by recounting a connection to his or her personal life or to other texts, while withholding judgment or interpretation. The other students and the teacher do not interrupt or raise questions. Class participants listen carefully and take notes, so that they can ask questions when all individuals in the group have taken a turn. Turns are taken in the order in which the group members sit. The teacher then pulls together the main threads and subsequently leads a class-wide discussion in which various questions are raised and issues explored. As a result, individual understandings are expanded and supposedly "expert" knowledge is called into question. Over time, a collaborative, generous, and "safe" space is cultivated in which ideas for action are generated.[5]

Debra Cole attended class with two interpreters and was given the opportunity to describe her experiences as a Deaf person with bilingualism and education, alongside hearing students in the class from a variety of backgrounds. These included immigrants from Latin America, Asia, and Africa; Native Americans; children of immigrants; and students of language majorities. The class, including Ofelia, raised questions about bilingualism that related to two of Debra's own languages: American Sign Language and Italian Sign Language. Ofelia had to enlarge her understanding of the bilingualism of immigrants by incorporating newly acquired insights from the bilingualism of all her students. For example, during the same semester in which Debra was enrolled in Ofelia's class, there was also a student of Wanka Quechua origin, an African student from Cameroon, and a Pakistani student whose home language was Punjabi, among others. Thus, Debra's bilingualism was but one example of the linguistic diversity and type of bilingualism that is prevalent in the United States.

But whereas only small adjustments had to be made to traditional conceptualizations of bilingualism when incorporating the languages of indigenous minorities or the complex multilingualism of Africa, Debra's Deaf bilingualism called into question many of the traditional concepts themselves that made up the canon of bilingual studies. Together, and with the help of the entire class, we began to question the fundamental assumptions we had made about language and bilingualism.

Debra subsequently took a second course with Ofelia that explored language policies in education in different global contexts. The course had been organized geographically, with little attention paid to Deaf language education policy. However, Debra's presence in the course started to disrupt assumptions about direct links between language and territory, as well as between language and identity. We also started to call into question language-education policies that are enacted top-down without regard to the complex and dynamic language practices evident among students and teachers as they create meaning in classrooms.

As a result of Debra's collaboration with Ofelia during this year, Ofelia completely revamped conceptualizations for a book she was planning to write on bilingual education. Instead of writing a text in which there was simply a separate section on Deaf bilingualism derived from hearing bilingualism, she decided to put the Deaf bilingual experience on equal footing with that of the hearing. Ofelia was collaborating with a well-known European scholar of bilingualism and bilingual education, Hugo Baetens Beardsmore, to ensure that her lens was broad enough to capture the global complexity. Ofelia then asked Debra to become her research assistant, requesting that, at times, she coauthor specific texts and thus change the traditional locus of enunciation held by hearing monolinguals. The result, *Bilingual Education in the Twenty-First Century: A Global Perspective,* may be considered an example of what Walter Mignolo calls "border thinking" and "subaltern knowledge," that is, "knowledge conceived from the exterior borders of the

modern/colonial world system."[6] Produced collaboratively by a hearing Latina immigrant; a Deaf, white, native-born American woman; and a hearing European man, the book challenges dominant twentieth-century understandings about bilingualism and bilingual education.

The rest of this chapter describes how the collaboration between García and Cole enlarged understandings of traditional concepts in the field of bilingualism and bilingual education and points to the gains that have been made through incorporating a Deaf lens into this field. The five enlarged concepts entail the following shifts:

1. From language and identity to *languaging and identifying*
2. From separate language skills to *expanded and interrelated language practices*
3. From linear bilingualism to *dynamic bilingualism*
4. From diglossia in schools to *transglossia*
5. From code-switching and monolingual pedagogies to *translanguaging as a process and a pedagogy*

Each of these concepts will be discussed in this chapter.

Enlarged Understandings: Languaging and Identifying

Writing about bilingualism from a "border" perspective means that essential concepts, such as language and culture, become questionable. We begin this section by first considering language and then looking at its relationship with identity, exploring these concepts from a perspective that puts the Deaf at the center.

Language has generally been understood as an autonomous system that is spoken in some geographical territory, most often a nation-state that has spent much energy developing grammars, dictionaries, and other material to ensure its standardization. Likewise, signed-language scholars, especially since William Stokoe and his followers, have consistently argued that signed language is, like any other language, an autonomous system, with its own standardized grammar.[7] Edward Klima and Ursula Bellugi convincingly showed that ASL is a structured linguistic system,[8] yet sign linguistics has continued to be subordinate to the linguistics of spoken languages, both written and unwritten.[9]

Postmodern sociolinguists have questioned the idea of language as a completely autonomous system, pointing to its social construction.[10] Pierre Bourdieu argued that "what circulates on the linguistic market is not 'language' as such, but rather discourses that are stylistically marked."[11] More than any other scholars, Sinfree Makoni and Alastair Pennycook have argued that "languages, conceptions of languageness and the metalanguages used to describe them are *inventions*."[12] Makoni and Pennycook add that our present conception of language was constructed by states that wanted to consolidate political power, thereby forcing standardization

in order to spread a specific way of languaging to control the population. In Makoni and Pennycook's view, languages were constructed and constituted "outside and above human beings,"[13] as Victor Yngve has also said.[14] Peter Mühlhäusler and Suzanne Romaine have also shown that in the traditional societies of the Pacific, the notion of discrete languages that can be enumerated makes little sense and has little to do with the communicative practices of their speakers.[15] Languages, as objectively described, often bear little resemblance to the ways in which people use language, or what Yngve and Makoni and Pennycook call their "languaging."[16]

In the discussion of whether signed languages are "real" languages, many continue to side with Helmer Myklebust in the belief that "[t]he manual sign language must be viewed as inferior to the verbal as a language."[17] But it turns out that it is not that signed language is different or exceptional with regard to other languages; rather, it is that all languages, including signed languages, are social constructions.[18] Stokoe suggested that a different way of looking at signed language might reform the linguistics of spoken languages.[19] Deaf languaging, with its multimodal, spatial nature, enables us to better understand the construction of all languages, both spoken and signed, and thus to invert the relationship in which sign linguistics has been subordinated to the linguistics of spoken language.

If Deaf languaging transformed the way in which we think about language in general, the same can be said about identity and its relationship to language. Since at least the eighteenth century and the contributions of the German romantics, language and identity have been viewed as naturally linked. Johann Gottfried Herder (1744–1803) defined ethnic identity as natural and immovable and closely connected to the language of a people. Although throughout the late nineteenth and the early twentieth centuries many thinkers offered nuanced critiques of the primordialist positioning on language and identity of the German romantics (see, for example, Frank Boas [1858–1942] and Max Weber [1864–1920]), others (for example, Edward Sapir [1884–1939] and his student Benjamin Lee Whorf [1897–1941]) asserted that language, culture, and identity are interconnected and that an individual's thoughts and ways of understanding the world and behaving are influenced by the language(s) he or she speaks. In the twentieth century, Joshua A. Fishman has continued the Whorf-Sapir tradition, stating that, for example, "[l]anguage is the recorder of paternity, the expresser of patrimony and the carrier of phenomenology."[20]

Recent postmodern scholarship, however, has signaled the situational and subjective construction of identity, shifting attention from an immovable identity to more fluid identities[21] and to the *mestizaje,* the fluidity and plurality of identities affected by new local and global ones.[22] This nonessentialist positioning of the language-and-identity link is perhaps best understood in thinking about the culture of the deaf.

Deaf culture is complex, because it includes some who are profoundly deaf;

others who are hard of hearing to different degrees; family members of the deaf, especially CODAs (children of deaf adults); and sign-language interpreters. Some come into deafness at birth, whereas others acquire it much later. Since the advent of amplification technology, especially cochlear implants, Deaf identity has become more fluid, with some opting for such implants and others against, with much opposition to the implants coming from the Deaf community itself. As Ila Parasnis explains, "[Deaf] bilingualism can be viewed as a continuum that includes people who may vary considerably in their linguistic knowledge, fluency and age at which they acquire each language."[23] The flexible ways in which Deaf language and identity practices operate bring to the forefront the fact that people do not use language based simply on their identity but instead *perform* their identity by using language in certain ways.[24] Deaf people are agentive beings who are perhaps the best example of what Aneta Pavlenko and Adrian Blackledge describe as "constantly in search of new social and linguistic resources that allow them to resist identities that position them in undesirable ways, produce new identities, and assign alternative meanings to the links between identities and linguistic varieties."[25] Deaf communities convincingly show us that it is language users who decide who they want to be, and who choose their languaging and identifying accordingly.

Although the languaging and identifying ideas of postmodern scholars circulate broadly in the literature for spoken languages, it is the Deaf, who are less constrained by the impositions of nation-states with regard to language use and identity, who convincingly demonstrate another angle. Viewing language and identity from the point of view of the users of a language (especially in the case of the Deaf), and not from that of a nation-state, argues for a languaging and identifying approach to the study of bilingualism in the twenty-first century, and for the challenging of dominant concepts such as "language skills," which is the subject of the next section.

Enlarged Understandings: Expanded and Interrelated Language Practices

Although there are more bilingual than monolingual people in the world, bilinguals, especially bilingual students, are often considered an anomaly in society and in schools. Thus, much attention has been paid to their "language skills." This section looks at four characteristics of the language of the Deaf that enabled us to shed our past understandings of language skills: expanded language practices, developmental complexity, different degrees of proficiency, and simultaneity of modalities. Each of these characteristics will be separately considered.

Expanded Language Practices

When speaking of bilinguals, a concern for their "language skills" figures prominently. Language skills are usually described as having two separate components: oracy (listening and speaking) and literacy (reading and writing). But this

definition is insufficient to capture the added dimension of languaging that the Deaf have—that of *signacy;* that is, the ability to attend to signs, as well as to produce signs.[26] Signacy further means that languaging capacities are expanded, now encompassing not only the modalities of sound of spoken language and visual images of written language but also visual movement that makes up signed languages by simultaneously combining hand configuration, location of the sign, motion of the hand, orientation of the hand, and facial expression. Of course, we know that these skills are interrelated and that literacy is not an autonomous skill. Literacy, as Brian Street has shown, varies by situation and entails complex social interaction that draws on all aspects of communication.[27]

Figure 6.1 displays the possibilities of the full languaging abilities of a bilingual hearing person. The abilities of oracy are usually developed in the home, as a home language, whereas the abilities of literacy, when they exist, are usually developed in school, as an additional language.[28] Of course, the additional language can also be developed at home, in interaction with siblings, family, and media, and the home language can also be developed in school, when a child attends a bilingual education program. The idea is that a full, balanced bilingualism can be developed if the home and the school work together.

Figure 6.2 shows the abilities that a Deaf bilingual American *may* develop, if he or she is fortunate enough to attend a bilingual school for the Deaf, an even more rare occurrence than attending a bilingual school for the hearing.

It is evident from contrasting Figure 6.2 with Figure 6.1 that a Deaf bilingual child *may* develop more languaging than a hearing bilingual child because of the possibility of another semiotic resource, that of signacy. Figure 6.2 captures the bilingualism of a Deaf child whose semiotic repertoire is always richer and more complex than that of a hearing child simply because of its signacy capacity. If the Deaf child is exposed to another spoken language, Deaf bilingualism is the same as that of a bilingual hearing child and much more; the Deaf child not only has

Type of Bilingual Ability	Oracy (in the home)	Literacy (in the school)	Signacy
Receptive	Listening: home language additional language	Reading: home language additional language	——
Productive	Speaking: home language additional language	Writing home language additional language	——

Figure 6.1. Hearing bilingualism: example of possible languaging abilities of a hearing bilingual.

Type of Bilingual Ability	Oracy (in the school or at home)	Literacy (in the school)	Signacy (in the school or at home)
Receptive	Listening? English	Reading: English	Attending to signs: ASL
Productive	Speaking? English	Writing: English	Producing signs: ASL

Figure 6.2. Deaf bilingualism in the United States: example of possible languaging abilities of a deaf bilingual American.

more language abilities but also can use them much more dynamically. In essence, these figures call into question the static categories of language skills that studies of bilingualism have long held dear.

Developmental Complexity

Although, as we saw in Figure 6.1, oracy for hearing children develops at home and literacy develops in school, the same direct skill–domain relationship cannot be claimed for the Deaf. The positioning of the Deaf child as a child of hearing parents or of deaf parents means that signacy may be acquired either at school or at home.[29] Whether a person is prelingually or postlingually deaf—that is, born with little or no hearing or having acquired skills in a spoken language before losing hearing—also affects when and where the Deaf person might have acquired the specific language skill, as well as the person's proficiency and use of the different skills.[30] Also, depending on whether the child is hard of hearing or profoundly deaf, oracy in the form of lipreading, and even speaking, may occur either at home or at school. This is evident in Figure 6.2.

It turns out that not only is the linguistic repertoire of a deaf child much richer than that of a hearing child, but its development is also more complex and relies heavily on at least three dimensions: the family context, the age at which the person became deaf, and the person's degree of deafness. The realization of the developmental complexity of Deaf bilingualism led us to question the concept of exclusive "domains" of use and acquisition that are often the basis for what is considered appropriate bilingual development for the hearing (more on this in the section on transglossia).

Different Degrees of Proficiency

When speaking about bilingualism, we often speak of receptive ability (listening, reading, and, for the Deaf, attending to signs) and productive ability (speaking, writing, and, for the Deaf, producing signs). When bilingual-education programs

for spoken languages are available, the goal is most often to educate people who will be both receptive and productive bilinguals. The emphasis is on *fully* acquiring all four of the oracy and literacy abilities. But the fluid languaging and identifying of the Deaf means that their languaging components—signacy, literacy, and especially oracy—are always developed *to different degrees*.

As we have indicated, as a result of a person's family and social context, the age at which deafness originated, and the relative degree of deafness, Deaf languaging varies significantly. Furthermore, as in other communities in which members of two distinct language groups are in close proximity, there is much language contact in Deaf languaging.[31] For all these reasons, full bilingualism and "ultimate" attainment of all language skills are not always achieved for Deaf children.

It was precisely the understandings of the different degrees of Deaf bilingualism that enabled us to adopt a more flexible position regarding the bilingualism of all children. This led us to challenge the traditional concepts associated with the field of second-language acquisition. The concept of moving learners toward "ultimate attainment,"[32] which is prevalent in second-language-acquisition studies, means that learners are viewed as incomplete, as if a static and complete set of grammar rules were available for acquisition. Focusing on Deaf bilingualism enabled us to better understand the fact that bilinguals are not simply two monolinguals in one[33] and that ultimate attainment is not a realistic representation of actual communicative practice.

Simultaneity of Modalities

Another characteristic of Deaf bilingualism that moved our traditional understandings of bilingualism is the influences and concurrent uses of the different modalities of Deaf languaging. It is possible for a Deaf person, for example, to sign and use the silent mouthing for a given word simultaneously, what Ceil Lucas and Clayton Valli have called "contact signing," an effect that makes the interrelated languaging of the Deaf even more complex.[34]

Traditionally the modalities of the language of the hearing are thought about separately, and it is said that one cannot speak English and Spanish simultaneously. But this is true only if one accepts that bilinguals speak two autonomous languages. If one instead sides with Makoni and Pennycook, it is easy to see that all bilinguals language simultaneously.[35] It is equally true that hearers make meaning by using different modalities simultaneously. For example, hearers may listen to a lecture and take notes simultaneously, or write and speak at the same time. Since the advent of New Literacy Studies, literacy is considered to be any interaction with print, including speaking, signing, listening, or attending to signs as words are read or written.[36] Furthermore, advanced technology has enhanced the capabilities for simultaneous languaging of all these modalities. Indeed, we became convinced that all competent users of language, not just the Deaf, must engage in "contact languaging" in the twenty-first century.

The four characteristics of Deaf bilingualism that we have been considering—the expanded practices provided by signacy; its developmental complexity; its different degrees of proficiency; and its capacity for simultaneity of modalities—led us to question traditional linear types of bilingualism and to find them insufficient. The next section describes how the conceptualization of dynamic bilingualism, a new type of bilingualism conceptualized by García was fueled, in part, by understandings gained from Deaf bilingualism.[37]

Enlarged Understandings: Dynamic Bilingualism

In 1974, Wallace Lambert proposed two types of bilingualism: *subtractive* and *additive*. Subtractive bilingualism refers to the type of bilingualism to which most language minorities are subjected; that is, the home language is "subtracted" as the school language is added. But subtractive bilingualism doesn't quite fit the Deaf. Sign language is not, in many cases, either their "mother tongue" or their "home" language, given that 90 percent of Deaf students are born to hearing parents. As we said before, Deaf children usually acquire signacy, alongside literacy and sometimes oracy, in school and not at home.

Additive bilingualism refers to situations in which the second language is "added" in school, with the result that the child subsequently becomes a speaker of two languages. The suggestion is that the child can become a "balanced" bilingual, able to use the two languages to the same extent. But as we said before, the fluid languaging and identifying of the Deaf mean that signacy, literacy, and even oracy are part of the languaging practices of the Deaf *to different degrees*.

It was thinking of Deaf bilingualism that eventually led García to finally shed the image of the balanced bilingual and the linear models of bilingualism as either additive or subtractive. Bilingualism goes beyond the notion of two autonomous languages and of additive or subtractive bilingualism, and instead suggests that the language practices of *all* bilinguals are complex and interrelated; they do not emerge in a linear way. Bilingualism does not result in either the balanced wheels of a bicycle (as the additive bilingual model purports) or the single wheel of a monocycle (as the subtractive bilingual model suggests). Instead, bilingualism is like an all-terrain vehicle, with individuals using it to adapt to the ridges and craters of communication in uneven terrains. Like a banyan tree, bilingualism is complex, as it adapts to the soil in which it grows.[38]

Dynamic bilingualism is a type of bilingualism that refers to the development of different language practices to varying degrees.[39] In some ways, dynamic bilingualism is related to the concept of "plurilingualism," as defined by the Council of Europe: the ability to use several languages to varying degrees and for distinct purposes; and an educational value that is the basis of linguistic tolerance.[40] The difference is that within a dynamic bilingual perspective, languages are seen not as autonomous systems that people "have" but as practices that people "use."

Unlike additive and subtractive types of bilingualism, dynamic bilingualism proposes that complex and interrelated plurilingual practices are both the center of how languaging occurs and the goal of communication in an increasingly multilingual world.[41]

The expanded and interrelated language practices of the Deaf led us to understand that the bilingualism of all groups in the twenty-first century is not linear but dynamic. Dynamic bilingualism goes beyond the linearity of additive and subtractive bilingualism and encompasses a plurilingualism in action, a "plurilinguaging" that puts at the center the meaning-making practices that people use in order to communicate. Dynamic bilingualism calls into question venerable assumptions of how language is used in society, including the concept of diglossia, which we discuss in the next section as we introduce our enlarged understanding of what we call "transglossia."

Enlarged Understandings: Transglossia

Conceptualizations of bilingualism in education have traditionally rested in understandings of diglossia; that is, the idea that in order for stable bilingualism to exist, there must be functional differentiation between two languages.[42] Thus, separating languages clearly and developing them fully have become the gold standard for bilingual-education programs. As a result, traditional bilingual-education programs have separated languages by allocating one language to a specific time, a specific teacher, a specific subject, and/or a specific place.[43]

But in thinking about the complex and dynamic languaging of the Deaf, it became clear that separating the languages of bilinguals in this way is unnatural and does not reflect the languaging of any bilingual individual. For example, in the program that Cole set up in Italy, it was important to have students develop both written and signed abilities, for both were needed to communicate with other Deaf communities. In teaching language minorities, the strict insistence on separating languages as a way to "protect" or isolate the weaker, nondominant language from that of the majority means that bilingual people are restricted in their languaging choices, given that, as we have seen, all bilinguals use their languages in interdependent ways. In the search to neutralize the power dimensions of two languages, that is, to work against the linguistic hierarchy of a majority and a minority language, or a spoken and a signed language, the sociolinguistic arrangement of putting two languages on equal but separate footing overlooks the complex language practices of all bilingual students. Keeping one language out of reach of the other works *against* developing bilingualism and appropriating an identity as a bilingual person.

As a result of this realization, García proposed the concept of "transglossia," that is, a stable and yet *dynamic* communicative network, with multiple languages operating in functional interrelationship.[44] Transglossia rests on, but also goes be-

yond, the important concept of heteroglossia posited by Bakhtin.[45] Bakhtin speaks of the differences of language practices and the different social forces that move them. Transglossia builds on these heteroglossic practices but adds an additional dimension that has much to do with the concept of *transculturación* coined by the Cuban ethnologist Fernando Ortiz in explaining the complex processes of cultural transformation in Cuban society.[46] *Transculturación* questions the linear and simple directionality of cultural impact from one source, Europe, to Cuba, and in so doing problematizes the epistemological purity of traditional descriptions. In the same manner, by changing the directionality of conceptualizations from those about spoken languages to signed languages, and from those about hearing bilingualism to Deaf bilingualism, transglossia questions traditional diglossic descriptions that often neutralize and render as normal the imposition of the language practices of dominant majorities over those of others.

Transglossia has little to do with the static maintenance of two or more languages of nation-states and other societal groups, a practice that preserves the asymmetry of language practices. The focus of transglossia is, instead, to question and transgress the power and knowledge of majority populations and also of hearers. Thus, the study of bilingualism moves beyond the defense of national languages and national ideologies and focuses instead on the fluid language practices of bilingual people, whether Deaf or not.

The interrelationships of the language practices of the Deaf leave us little doubt that restricting the languaging of bilinguals to separate language practices is artificial. Traditionally, scholars of bilingualism for the hearing have talked about code-mixing or code-switching between languages as a pragmatic choice that serves specific purposes in particular contexts.[47] In speaking about Deaf bilingualism, however, Ira Gawlitzek-Maiwald and Rosemarie Tracy suggest that the fluidity of language practices of the Deaf, unlike the situation for hearers, constitutes not a pragmatic choice but a "pooling of resources" to make meaning.[48] Bruno Menéndez adds that for the Deaf, this "language mixing" is "a valuable tool that triggers the engine of bilingual development through metalinguistic reflection, implying contrastive teaching methods."[49] It was this idea, coupled with our observation that hearing bilinguals behaved in much the same way, that led García to shed the constraints of code-switching for all bilinguals and speak instead of translanguaging.[50]

Extending the term used to describe a pedagogy developed by a Welsh bilingual teacher, Cen Williams,[51] translanguaging, for García, refers to the *process* by which bilinguals engage in complex discursive practices. It is conceived from a bilingual position that includes all the complex language practices of bilinguals, including those of the Deaf. Translanguaging transgresses the reified categories of language, exposing meanings and histories buried within fixed language systems and identities.

Bilingual-education programs are frequently involved in separating languages that are often used by bilinguals simultaneously. Translanguaging as a pedagogy is precisely a way of working in the gap between, on the one hand, the global designs of nation-states for their educated citizens and, on the other hand, the local histories of all peoples who language differently. The insistence that the many language practices of bilinguals be performed in isolation in schools has worked against bilinguals' plurilingual development, as well as their education. It is clear that, as many scholars have started to recognize, translanguaging as a bilingual pedagogy is important in order both to make sense of language and content and to build on the complex and multiple language practices of students and teachers.[52] By including the Deaf perspective, it became even clearer to us that educators meaningfully educate when, as Nancy Hornberger and Ellen Skilton-Sylvester have said, they draw upon the full linguistic repertoire of all bilingual students.[53]

Conclusion

This chapter has described how the collaboration between a Deaf doctoral student of bilingualism and her teacher profoundly changed the ways in which her teacher thought about bilingualism and bilingual education. As she began to understand the bilingualism of the Deaf and issues in their education, García started realizing that these were the same issues faced by hearing bilinguals. The Deaf case simply reframed bilingualism from an angle that put bilingual language minorities, both Deaf and hearing, at the center, and thus changed the locus of enunciation. Rather than repeat traditional descriptions of bilingualism and bilingual education, García, through the collaboration with Cole as well as with Baetens Beardsmore, was able to generate "an other tongue"[54] to describe bilingualism from a minority perspective.[55]

These newly generated descriptions questioned traditional concepts of language and identity: language skills, types of bilingualism, diglossia, code-switching, and separate-language bilingual pedagogies. In their place, we were able to generate five concepts that are more appropriate to studying bilingualism and bilingual education in the twenty-first century:

1. Language and identity are not necessarily linked for bilinguals. Instead, bilinguals perform their identities by acts of languaging and identifying.
2. The languaging of bilinguals is complex, interrelated, simultaneous, and never in any way balanced.
3. Bilingualism is not linear but dynamic.
4. Diglossia does not neutrally describe stable bilingual situations. A dynamic yet stable transglossia might be a more neutral description.
5. Separate language practices and code-switching are ways of describing bilingualism from a monolingual point of view. From a more heteroglossic point of view, what we see is translanguaging.

Besides transforming traditional concepts with regard to bilingualism, thinking about languaging abilities for the Deaf in relationship to schooling leads us to question the ultimate goal of schooling. Is it to educate? or is it to stamp out cultures and people who are different? It is clear that the neglect on the part of schools of the signacy ability that is at the core of Deaf identity signals an attempt to eradicate the languaging and identification possibilities of that identity. More than with hearing examples, the ways in which schools tend to the language abilities of the Deaf give clear evidence that the goal of schooling is not just to educate but also to force minorities into conforming to the ways of being, and of languaging, of the majority. Thus, Deaf bilingualism has taught us not only to enlarge our concepts but also to renew our struggles to ensure that all language minorities be given an equitable education in which their language practices are not only used but also valued for what they really are.

Notes

1. H-Dirksen L. Bauman and Joseph J. Murray, "Deaf Studies in the Twenty-First Century: Deaf-Gain and the Future of Human Diversity," in *Oxford Handbook of Deaf Studies, Language, and Deaf Education,* ed. Marc Marschark and Patricia Spencer, vol. 2 (Oxford: Oxford University Press, 2010).
2. Debra L. Cole, "English as a Foreign Language for Deaf Adult Students: Rethinking Language Learning amidst Cultural and Linguistic Diversity," in *English in International Deaf Communication*, ed. Cynthia J. Kellett Bidoli and Elana Ochse (Bern, Switz.: Peter Lang, 2008), 179–92.
3. Patricia Carini, "Images and Immeasurables II" (Prospect Center Occasional Papers, Prospect Center for Education and Research, North Bennington, Vt., 1993); Patricia Carini, "Prospect's Descriptive Processes" (3–20), and other essays in *From Another Angle: Children's Strengths and School Standards,* ed. Margaret Himley and Patricia Carini (New York: Teachers College Press, 2000).
4. Ofelia García and Cecelia Traugh, "Using Descriptive Inquiry to Transform the Education of Linguistically Diverse U.S. Teachers and Students," in *Opportunities and Challenges of (Societal) Bilingualism,* ed. Li Wei, Jean-Marc Dewaele, and Alex Housen (Berlin: Walter de Gruyter, 2002), 311–28; Ofelia García and Patricia Velasco, "Observando, colaborando, y describiendo: Devolviéndole el poder a los docents," in *Empowering Teachers across Cultures*, ed. Anne-Marie De Mejía and Christine Hélot (Bern: Peter Lang, 2002), 1–16.
5. Cecelia Traugh, "Descriptive Notes of Inquiry Sessions with TAL Faculty" (unpublished manuscript, 2002); García and Traugh, "Using Descriptive Inquiry to Transform the Education of Linguistically Diverse U.S. Teachers and Students."
6. Walter Mignolo, *Local Histories/Global Designs: Coloniality, Subaltern Knowledges, and Border Thinking* (Princeton: Princeton University Press, 2000), 11. García's volume is *Bilingual Education in the Twenty-First Century: A Global Perspective* (Malden, Mass.: Blackwell/Wiley, 2009).
7. William Stokoe, *Sign Language Structure: An Outline of Visual Communication Systems of the American Deaf* (Buffalo, N.Y.: Dept. of Anthropology and Linguistics, University of Buffalo, 1960).
8. Edward S. Klima and Ursula Bellugi, *The Signs of Language* (Cambridge, Mass.: Harvard University Press, 1979).
9. Jan Branson and Don Miller, *Damned for Their Differences: The Cultural Construction of Deaf People as Disabled* (Washington, D.C.: Gallaudet University Press, 2007); Carol Padden and Tom Humphries, *Inside Deaf Culture* (Cambridge, Mass.: Harvard University Press, 2001).

10. Monica Heller, *Linguistic Minorities and Modernity* (New York: Pearson, 2009); Sinfree Makoni and Alastair Pennycook, *Disinventing and Reconstituting Languages* (Clevedon, UK: Multilingual Matters, 2007); Peter Mühlhäusler, "Language Planning and Language Ecology," *Current Issues in Language Planning* 1, no. 3 (2000): 306–67; Suzanne Romaine, *Language in Society* (New York: Oxford University Press, 1994).
11. Pierre Bourdieu, *Language and Symbolic Power,* trans. Gino Raymond and Matthew Adamson (Cambridge, UK: Polity Press, 1994), 39.
12. Makoni and Pennycook, *Disinventing and Reconstituting Languages,* 1 (our emphasis).
13. Ibid.
14. Victor Yngve, *From Grammar to Science: New Foundations for General Linguistics* (Amsterdam: John Benjamins, 1996), 28.
15. Mühlhäusler, "Language Planning and Language Ecology"; Romaine, *Language in Society.*
16. Yngve, *From Grammar to Science;* Makoni and Pennycook, *Disinventing and Reconstituting Languages.*
17. Helmer Myklebust, *The Psychology of Deafness: Sensory Deprivation, Learning, and Adjustment* (New York: Grune & Stratton, 1957), 241–42.
18. Branson and Miller, *Damned for Their Differences.*
19. William Stokoe, *Why Sign Came before Speech* (Washington, D.C.: Gallaudet University Press, 2001).
20. Joshua A. Fishman, "Language and Ethnicity" (1977), in *Language and Ethnicity in Minority Sociolinguistic Perspective* (Clevedon, UK: Multilingual Matters, 1989), 32.
21. Homi K. Bhabha, *The Location of Culture* (New York: Routledge, 1994).
22. García, *Bilingual Education in the Twenty-First Century;* Aneta Pavlenko and Adrian Blackledge, eds., *Negotiation of Identities in Multilingual Contexts* (Clevedon, UK: Multilingual Matters, 2004).
23. Ila Parasnis, "On Interpreting the Deaf Experience within the Context of Cultural and Language Diversity," in *Cultural and Language Diversity and the Deaf Experience,* ed. Ila Parasnis (New York: Cambridge University Press, 1996), 4.
24. Alastair Pennycook, "English, Politics, Ideology: From Colonial Celebration to Postcolonial Performativity," in *Ideology, Politics, and Language Policies: Focus on English,* ed. Thomas Ricento (Amsterdam: John Benjamins, 2000), 107–19.
25. Pavlenko and Blackledge, *Negotiation of Identities in Multilingual Contexts,* 27.
26. Stephen M. Nover and John F. Andrews, "Critical Pedagogy in Deaf Education: Bilingual Methodology and Staff Development" (USDLC Star Schools Project Report no. 2, Year Two, 1998–1999, New Mexico School for the Deaf, Santa Fe, 1999).
27. Brian Street, *Literacy in Theory and Practice* (Cambridge: Cambridge University Press, 1985).
28. We prefer the term "home language" to "mother tongue" because of the inexactitude of the latter term. We also prefer "additional language" to "second language" because, when putting bilingualism at the center, the idea of a "first" or "native" language, as well as a "second language," is disputed. For more on this, see García, *Bilingual Education in the Twenty-First Century.*
29. Ceil Lucas and Clayton Valli, *Language Contact in the American Deaf Community* (New York: Academic Press, 1992); Pamela Knight and Ruth Swanwick, *Working with Deaf Pupils: Sign Bilingual Policy into Practice* (London: Fulton, 2002).
30. Carol J. Erting, Carlene Thumann-Prezioso, and Beth Benedict, "Bilingualism in a Deaf Family," in *The Deaf Child in the Family and at School*, ed. Patricia Spencer, Carol Erting, and Marc Marschark (Mahwah, N.J.: Erlbaum, 2000), 41–54.
31. Marc Sebba, *Contact Languages: Pidgins and Creoles* (London: Macmillan, 1997).
32. L. Selinker, "Interlanguage," *International Review of Applied Linguistics* 10 (1972): 209–31.
33. François Grosjean, *Life with Two Languages* (Cambridge, Mass.: Harvard University Press, 1982).

34. Lucas and Valli, *Language Contact in the American Deaf Community.*
35. Makoni and Pennycook, *Disinventing and Reconstituting Languages.*
36. Street, *Literacy in Theory and Practice.*
37. García, *Bilingual Education in the Twenty-First Century.*
38. See ibid.
39. Ibid.
40. Council of Europe, *Common European Framework of Reference for Languages: Learning, Teaching, Assessment* (Strasbourg, France: Language Policy Division, 2000).
41. See, for example, Carolina Plaza-Pust and Esperanza Morales-López, "Language Development, Interaction, and Maintenance in Sign Language Contact Situations," in *Sign Bilingualism: Language Development, Interaction, and Maintenance in Sign Language Contact Situations,* ed. Carolina Plaza-Pust and Esperanza Morales-López (Amsterdam: John Benjamins, 2008), 333–79.
42. Joshua A. Fishman, "Language and Ethnicity"; Charles Ferguson, "Diglossia," *Word* 15 (1959): 325–40.
43. García, *Bilingual Education in the Twenty-First Century.*
44. Ibid.
45. Michel Bakhtin, *Dialogic Imagination: Four Essays* (Austin: University of Texas Press, 1981).
46. Fernando Ortiz, *Cuban Counterpoint: Tobacco and Sugar* (Durham, N.C.: Duke University Press, 1995).
47. Peter Auer, "The Pragmatics of Code-Switching: A Sequential Approach," in *One Speaker, Two Languages: Cross-Disciplinary Perspectives on Code-Switching*, ed. Lesley Milroy and Pieter Muysken (Cambridge: Cambridge University Press, 1995), 115–35; John Gumperz, *Discourse Strategies* (Cambridge: Cambridge University Press, 1982); Carol Myers-Scotton, *Multiple Voices: An Introduction to Bilingualism* (Malden, Mass.: Blackwell, 2006).
48. Ira Gawlitzek-Maiwald and Rosemarie Tracy, "Bilingual Bootstrapping," *Linguistics* 34, no. 5 (1996): 901–26.
49. Bruno Menéndez, "Cross-Modal Bilingualism: Language Contact as Evidence of Linguistic Transfer in Sign Bilingual Education," *International Journal of Bilingual Education and Bilingualism* 13, no. 2 (2010): 206.
50. García, *Bilingual Education in the Twenty-First Century.*
51. Colin Baker, *Foundations of Bilingual Education and Bilingualism,* 4th ed. (Clevedon, UK: Multilingual Matters, 2006).
52. See Angela Creese and Adrian Blackledge, "Translanguaging in the Bilingual Classroom: A Pedagogy for Learning and Teaching?," *Modern Language Journal* 94, no. 1 (2010): 103–15; Suresh Canagarajah, "Constructing Hybrid Postcolonial Subjects: Codeswitching in Jaffna Classrooms," in *Voices of Authority: Education and Linguistic Difference*, ed. Monica Heller & Marilyn Martin-Jones (Westport, Conn.: Ablex, 2001), 193–212; Suresh Canagarajah, *Reclaiming the Local in Language Policy and Practice* (Mahwah, N.J.: Erlbaum, 2005); Jim Cummins, *Language, Power, and Pedagogy: Bilingual Children in the Crossfire* (Clevedon, UK: Multilingual Matters, 2000); Jim Cummins, "Rethinking Monolingual Instructional Strategies in Multilingual Classrooms," *Canadian Journal of Applied Linguistics* 10, no. 2 (2007): 221–40; and Muxel Saxena, "Construction and Deconstruction of Linguistic Otherness: Conflict and Cooperative Code-Switching in English/Bilingual Classrooms," *English Teaching: Practice and Critique* 8, no. 2 (2009): 167–87; among others.
53. Nancy Hornberger and Ellen Skilton-Sylvester, "Revisiting the Continua of Biliteracy: International and Critical Perspectives," in *Continua of Biliteracy: An Ecological Framework for Educational Policy, Research, and Practices in Multilingual Settings*, ed. Nancy Hornberger (Clevedon, UK: Multilingual Matters, 2003), 35–70.
54. Mignolo, *Local Histories / Global Designs.*
55. García, *Bilingual Education in the Twenty-First Century.*

7

WHAT WE LEARNED FROM SIGN LANGUAGES WHEN WE STOPPED HAVING TO DEFEND THEM

CINDEE CALTON

George Veditz, the seventh president of the National Association of the Deaf, proclaimed sign language to be "the noblest gift God has given to deaf people."[1] And certainly Deaf people have gained and continue to gain enormously from their use of sign languages. However, Deaf people are not the only people to gain from the presence of sign languages. This chapter will expand on H-Dirksen Bauman and Joseph Murray's concept of Deaf Gain with respect to the study of sign languages.[2] Specifically, I argue that the study of sign languages is helping to transform our understanding of the very nature of language. The recognition that sign languages are indeed languages has required that we work them into our understanding of language in general. Doing so exposes the many ways in which our deeply held "commonsense" notions of language and culture are in fact ideological in nature. By exposing these ideologies for what they are, we find that the study of sign languages is profoundly impacting our understanding of language and has the potential to continue doing so for many years to come.

Deaf Gain and Sign Languages

Deaf studies offers a unique perspective on hearing "loss" that Bauman and Murray have termed "Deaf Gain."[3] This perspective turns the usually dominant hearing cultural view of deafness on its head and represents deafness in terms not of what is lost (hearing) but of what is gained (Deafness and Deaf culture). This concept builds on decades of work by Deaf studies scholars who have argued that Deaf people in the United States do not view deafness in the same way as the hearing majority.[4] Whereas the hearing majority sees deafness as negative or pathological, Deaf people often see it as positive. Bauman and Murray take this idea one step further. They argue not just that Deaf people gain from their culture but that we all, hearing and Deaf alike, gain from the presence of Deaf people on the planet. Thus, Bauman and Murray build on work in bioethics[5] and argue that there are both intrinsic benefits (benefits to the Deaf themselves) and extrinsic benefits (benefits to the whole world) to the existence of Deaf communities. According to

Bauman and Murray, "[O]ne of the key Deaf contributions is a greater understanding of what it means to be human."[6] Language is certainly central to what it means to be human, so it is not surprising that one of the contributions that Bauman and Murray list is that of sign languages. Because our definition of language now includes multiple modalities, we must shift our focus away from the mouth and ears to what both of these modalities share: the brain. This shift has not necessarily been completely embraced by the whole field of linguistics. This is because truly incorporating sign languages into our understanding of languages requires, on the one hand, accepting that many long-held notions of language are ideological in nature and, on the other hand, reformulating the very meaning of language.

Ideologies of Language

As a framework for understanding the truly revolutionary impact sign-language research has had on several language ideologies, I will first briefly discuss language ideologies. However, a discussion of ideology in general is warranted first. Kathryn Woolard proposes that ideologies reflect the "experience or interest of a particular social position" (most likely a dominant social position), despite the fact that ideologies are cast as "universally true."[7] Antonio Gramsci and Norman Fairclough both use the term *common sense* in reference to ideologies.[8] Society accepts and takes ideologies for granted as being "common sense," and thus they often remain unchallenged despite the fact that they vary widely cross-culturally.

In the last four decades, language ideologies have become one of the central topics of study in the field of linguistic anthropology. Language ideologies consist of "the cultural (or subcultural) system of ideas about social and linguistic relationships, together with their loading of moral and political interests."[9] Language ideologies include both beliefs about language and language use in general, as well as ideologies about specific languages. Language ideologies are important to the study of language because they are the "mediating link between social forms and forms of talk."[10] Of particular interest to this chapter is Michael Silverstein's critique of what he calls "European folk ideologies of language."[11] In naming European ideologies "folk" ideologies, Silverstein brings our attention to the fact that Western perceptions of language are just as ideologically driven as other cultures' perceptions. One important source of the power of language ideologies, like ideologies in general, is the fact that they are "implicit and taken for granted."[12] The Western ideologies of language discussed in this chapter are taken for granted in both the general population and among scholars.

As social actors, linguists and other scholars of language carry with them ideological orientations to language. Linguistic work is influenced by and in turn influences "commonsense" notions of languages. Language research thus can and should be treated as an object of study for the field of language ideology.[13] Like other social actors, linguists and linguistic anthropologists often have a stake in the debates they witness.[14] There is no "gaze that is not positioned,"[15] even for

an "outsider" to a group. For example, Judith Irvine and Susan Gal's analysis of linguists studying the Macedonian language reflects the biases of those linguists' national affiliations. Not surprisingly, Greek linguists emphasize features that connect Macedonian with Greek, Bulgarian linguists emphasize characteristics that connect Macedonian with Bulgarian, and Serbian linguists emphasize characteristics that connect Macedonian with Serbian.[16] Similarly, nineteenth-century philologists explained their inability to fit European grammatical ideas to the grammar of Native American languages as a "failure on the part of 'primitive' languages."[17] Likewise, early linguistic work on African American English (AAE) characterized it as "an ineffective attempt to speak AE [American English]"[18] or as an indication of the cognitive deficiencies of African Americans. In each case, pervasive ideologies in a particular time or place impacted the work of language scholars. Like other people, linguists and other scholars of language understand linguistic form through language ideology.

Just as Bauman and Murray's concept of Deaf Gain demonstrates both intrinsic and extrinsic benefits to society of the presence of Deaf people, the study of sign languages has contributed significantly to the study of languages, both intrinsically and extrinsically. Intrinsically, research on sign language has proven that sign languages are indeed languages in their own right, which is of enormous benefit to Deaf people and hearing signers. Extrinsically, the fact that sign languages are so different from spoken languages means that their existence calls into question many previously held ideological assumptions about the nature of language. The next three sections will discuss three important assumptions about language that sign-language research calls into question: the ideology that sign language is not a language, the ideology that language must be made up entirely of arbitrary signs, and the ideology that gesture is not a central part of language.

Refuted Ideology I: Sign Language Is Not a Language

Linguists studying sign languages must contend not only with their own ideologies about language and sign languages but also with the ideologies of their colleagues in linguistics and other fields, and with those of wider society. When William Stokoe first published his work making the case that American Sign Language (ASL) is a language,[19] there was a strong ideology that language and vocal speech were synonymous.[20] As Scott Liddell explains, "Had Stokoe been studying the grammatical properties of a previously unknown spoken language, the readiness to accept it as a language would have been different. Even if Stokoe had discovered a radically different grammatical property of a spoken language, there still would have been no question about the linguistic status of the spoken language."[21] Although it has been more than fifty years now since Stokoe made his initial argument, ASL is still not accepted as a true language by a sizable portion of the population. Dominant Western ideologies of sign language often reinforce

hierarchies of power that tend to place sign languages below spoken languages and the deaf below the hearing.[22] As recently as 1997, the Modern Language Association still listed ASL as an "invented language" alongside Klingon,[23] a made-up language spoken by an alien species in the science fiction franchise *Star Trek*. Similarly, American colleges and universities have sometimes resisted proposals to allow students to take ASL to fulfill foreign-language requirements.[24] Arguments against ASL's acceptance generally assume that ASL is invented, that it is a visual form of English, or that it lacks a literature. Clearly, ideologies that represent ASL either as not a language or as a less complex language than spoken languages persist and thus have the potential to influence the work of language scholars even today.

Early works in sign linguistics were clearly aware of the ideologies of wider society about sign languages. They were also clearly concerned about such ideologies and felt it important to counteract them. This is apparent in two ways. First, regardless of the topic of their research, researchers took time to explicitly dispel myths and misunderstandings about sign languages. Second, linguistics tended to focus on similarities between signed languages and spoken languages.[25]

Linguists working on sign language in the 1970s were well aware of the ideological positions held by most members of American society about sign languages. Reviewing the discourse used in their works, particularly their introductions, reveals this concern. Many linguists began their works by highlighting the fact that sign languages were in fact valid languages. Robbin Battison, for example, opens his article "Phonological Deletion in American Sign Language" by listing four myths about sign languages and then refuting them, stating, "I have chosen to refute these four basic myths because they are pervasive and influential, and because they are a common feature. While they each claim something different about sign language behavior, *each claim implies that sign languages are fundamentally and linguistically different from spoken languages*."[26] Battison's concern with myths about sign languages demonstrates his expectation that his audience believed at least some of the myths; if they didn't, refuting them would not be necessary. Further, his italicized statement highlights his express desire to show that sign languages and spoken languages are basically the same, save for modality. Edward Klima and Ursula Bellugi also address popular conceptions of sign language early on in their book *The Signs of Language:* "In this primary communication system, developed and used by deaf people in the United States, we have found, as linguists have found in spoken languages throughout the world, a form with its own highly articulated means for expressing and relating concepts, and with an underlying network of regularities connecting visual form with meaning. ASL is clearly a separate language, distinct from the spoken English of its surrounding community."[27] Klima and Bellugi state that they went into the study not knowing or expecting to find that ASL was a language, a claim that seems clearly

intended to legitimize their findings. Sign-language linguists were clearly aware of the ideologies of the general public and the real-world social implications of the legitimacy of sign languages.

Linguists also addressed specific ideologies about sign languages they perceived in the public at large. For example, Lynn Friedman introduces her edited volume *On the Other Hand* by addressing many of the myths about sign languages: "ASL (like other sign languages) is not derivative of any oral language. Its 'phonological,' syntactic, and semantic structure is unique. It is not an alphabetic code for English, although the one-handed manual alphabet is used in limited ways in ASL, for instance to borrow technical terms or names from English."[28] This quotation demonstrates that Friedman also expected that at least part of her audience did not recognize the legitimacy of sign languages and continued to have misconceptions about ASL's nature. Similarly, Robert Ingram's first paragraph of "Theme, Rhyme, Topic, and Comment in the Syntax of American Sign Language" begins, "For centuries it was generally assumed that sign languages of the deaf had no syntax."[29] Like Battison and Friedman, Ingram was clearly concerned that part of his audience would have misconceptions about sign language that he needed to address. Carol Padden was similarly concerned with the work of others, such as David Crystal and Elma Craig,[30] that argued there was no "true syntactic patterning" in ASL.[31] James Woodward directly lists the potential objectors in "Language Continuum: A Different Point of View," stating, "[B]ut of course there are those who refuse to accept the grammaticality of ASL-codification or no codification. Usually these people fall into two camps—one says ASL has no grammatical structure; the other says that ASL is bad English."[32] In specifically listing people who doubted ASL's legitimacy, Woodward makes clear he expected either that some of them were reading his article or that people reading it knew people in such a camp. Linguists were fighting ideological resistance to sign languages both inside and outside of linguistics.

As said earlier, linguists have ideologies of their own, and thus their work can and must be regarded as data in the field of language ideology. Linguists examining sign language early on were also concerned about the ideologies of others. Their persistence in introducing and disproving myths about ASL demonstrates this concern, as does their downplaying of sign languages' differences from spoken languages.

Establishing that sign languages are full, legitimate languages is of enormous intrinsic benefit to Deaf communities because of a pervasive modern ideology that views language as the central element of culture. Western ideologies of language treat each culture as being easily and neatly defined by the use of one language.[33] Thus, if Westerners do not recognize the legitimacy of a language, they will not recognize the legitimacy of the cultural group using that language. The history of the study of Deaf peoples in the field of anthropology demonstrates this point. Anthropology came late to the study of Deaf communities and their sign languages

when compared with linguistics, though anthropological work began to increase in the 1990s.[34] This is likely due to the fact that, prior to the linguistic research that validated the linguistic legitimacy of sign languages, anthropologists viewed sign languages in a similar way as most of the general population. Anthropologists in the late nineteenth century and early twentieth century who encountered sign systems among Native Americans and Australians often took interest in such systems but generally assumed them to be universal, mostly pantomimic, and mutually intelligible with sign languages used by deaf people.[35] Anthropologists also operated within a paradigm that viewed cultural groups as bounded and defined by a one-language, one-culture paradigm.[36] This paradigm accepts as a given that membership in a cultural group is defined isomorphically with the use of one particular language. It affects the thought of both scholars and others.[37] This meant that sign languages and Deaf people were not perceived as suitable topics of study—that is, until sign languages were recognized as languages.

Deaf activists in the United States and abroad are clearly aware of the central role that language plays in legitimizing a cultural group. For example, American Deaf activists' most central claim to legitimacy as a cultural group is their separate language that is different from that of other Americans.[38] In comparing themselves with other groups, American Deaf people tend to select other language groups rather than disability groups.[39] Karen Nakamura documented a similar pattern among a segment of the Japanese Deaf community. In the Japanese case, those Deaf people who saw Japanese Sign Language as a separate language also argued for a separate Deaf culture and identity. Those who argued for a Japanese Sign Language based on spoken Japanese saw themselves as "Japanese first and deaf second" and advocated for inclusiveness in Japanese society.[40] Similarly, Richard Senghas's research on the emergence of Nicaraguan Sign Language demonstrates that Nicaraguans recognized Deaf people as a minority after the emergence of their sign language.[41] These examples highlight the vital importance of the recognition of sign languages to Deaf communities and their fights for equality. Just as "the preservation of Deaf culture clearly benefits Deaf people,"[42] the recognition and preservation of sign languages benefit Deaf people.

After sign-language linguistics' formative years, many linguists began to examine the ways in which sign language is different from, rather than similar to, spoken languages. This involved examining topics that were previously downplayed or left unaddressed. David Armstrong articulated this viewpoint when he stated, "ASL is in fact quite different from spoken languages. It employs entirely different sensory and motor systems in reception and production, and this difference appears to be related to a different organization of processing in the brain. It is important to stress, however, that there is nothing wrong with sign languages being different—perhaps for some purposes the difference is advantageous."[43] Sign languages need not be exactly similar or even mostly similar to spoken languages in order for them to be languages. Thanks to the pioneering work of Sto-

koe and other early sign-language linguists, it is well established that ASL is in fact a language. However, as Armstrong argues, sign languages differ from spoken languages in many important ways—ways that were (and in many ways still are) assumed to be definitive characteristics of languages. Research on sign languages challenges those long-held assumptions and thus is of great benefit to the study of languages.

Refuted Ideology II: Languages Must Be Made Entirely of Arbitrary Signs

Linguistic research traditionally has a bias against the iconic.[44] The reasons for this bias seem to link back, at least in some part, to "Saussure's declaration that the relation of the *signifiant* [signifier] to the *signefie* [signified] is arbitrary," a claim that remained unchallenged well into the 1970s.[45] Saussure's conception of iconicity was "for years used to shut down discussions of the iconic aspects of language."[46] In fact, the iconicity present in sign languages may be one of the core reasons for many of the misconceptions held about it in the general public. In my own anecdotal experiences, I have found that nonsigners seem to expect iconicity and react with confusion when I show them a sign in which they cannot identify an iconic element. Western linguistics' bias against iconic elements has impacted linguistic research on and perceptions of sign language.

Early linguists of American Sign Language avoided acknowledgment of iconicity in sign languages.[47] Early ASL linguists often addressed this issue as a misconception. For example, one of the myths that Battison was concerned about was the idea that the signs of ASL were ideographic.[48] Similarly, Harry Hoemann starts out his article "The Transparency of Meaning of Sign Language Gestures" by discussing the sometimes-expressed opinion that "the ideographic lexicon of American Sign Language makes it an inferior language."[49] Clearly, iconicity was viewed as problematic with regard to establishing ASL's linguistic status. As two linguists later put it, "linguists had a definite sense that admitting the existence of iconicity in sign languages was admitting that sign languages were not 'real' languages."[50] This avoidance of iconicity in sign-language research shows clearly the pervasive Western ideological orientation favoring the arbitrary over the iconic in linguistic systems.

The data that linguists gathered also often centered on the establishment of the arbitrary nature of signs. Hoemann's article, for example, directly responds to an earlier study by Ilana Breger that argued that the meaning of many signs was transparent to nonsigners.[51] Hoemann criticized the multiple-choice elicitation method of Breger's study and conducted his own. Hoemann's study found a much lower success rate in guessing the meaning of signs when subjects were given no choices to select from. Similarly, Klima and Bellugi argue that "grammatical processes operate on ASL signs without reference to any iconic properties of the signs themselves."[52] They give examples of this phenomenon, one of which is the sign for YEAR. They see the sign YEAR as an iconic representation of the earth revolv-

ing around the sun, but when the sign is altered to mean "every year," the hand that stood for the earth no longer rotates around the other. Instead it hits the hand representing the sun several times, with the index finger extending each time the two hands hit. Nancy Frishberg also looked at the idea of iconicity in American Sign Language. Her analysis argues that, although many signs may have started as iconic, over time they have moved toward the arbitrary. Frishberg argues, for example, that over time signs became more symmetric and moved toward the center of the signing space. According to Frishberg, these processes aided both the production and perception of signs, somewhat like the phonological processes that linguists argue act upon spoken articulation.[53] These examples show that there was a great deal of focus in sign linguistics on downplaying iconicity in sign languages.

Many linguists of sign language have acknowledged and analyzed iconicity in sign languages. However, such linguists are clearly still aware that many people remain unconvinced about sign language's linguistic status. They are also aware that linguists tend to favor the arbitrary over the iconic. Analysis of the discourse used by linguists arguing in favor of iconicity in sign languages demonstrates that they feel compelled to justify iconicity's presence in sign languages. This takes form in two main ways: arguments that challenge assumptions that spoken languages are not iconic, and arguments that downplay the importance of arbitrariness in language.

Several linguists have proposed that spoken language is not as arbitrary as was previously assumed.[54] Such scholars have argued for the presence of iconicity in the syntax of spoken language,[55] as well as in other aspects, such as intonation.[56] Iconicity can also be found in the grammars of sign languages. Sherman Wilcox's concept of cognitive iconicity argues that iconicity is a reflection of the conceptualized state of affairs, not just the actual state of affairs. Wilcox defines cognitive iconicity "not as a relation between the form of a sign and what it refers to in the real world, but as a relation between two conceptual spaces."[57] The iconicity in signed and spoken languages is, then, a relationship not between linguistic forms and an objective reality but between linguistic forms and our conceived reality. The ideological bias against the iconic thus may have led scholars to ignore or downplay its presence in all languages, spoken or signed.

Linguists have also challenged the assumption that greater iconicity in sign languages is problematic in the first place. Mark Mandel states this early on in his article "Iconic Devices in American Sign Language," arguing that in fact "it is de Saussure's claim [that languages are essentially arbitrary] that requires support" and that, when studying language in a different modality, we should "be prepared to encounter facts and patterns at variance with our previous experiences."[58] Sarah Taub, for example, sees the greater iconicity in sign languages as a simple function of the modality, arguing in her introduction to *Language from the Body* that "the relative scarceness of iconicity in spoken language is not a virtue—it is

merely a consequence of the fact that most phenomena do not have characteristic noise to be used in motivating a linguistic phenomenon."[59] Although many of the objects in our environment have visual shapes or movements we can associate with them, most of them do not make noises we can easily imitate with our vocal tract. And for many of the phenomena that do, such as a dog's bark, we have iconic sounds to represent them. Similarly, Tommaso Russo argues, "[T]he different role that iconicity plays in vocal and signed languages cannot lead, in any sense, to questioning the linguistic status of signed languages; on the contrary that role can help us extend our knowledge of the similarities and differences between two language types, spoken and signed, both of which iconic features affect to some extent."[60] Like Taub, Russo believes that iconicity is present but in no way delegitimizes sign language's linguistic status. Liddell takes this argument even further, arguing that "the notion that words exhibiting onomatopoeia or iconic signs are somehow more primitive and less precise than arbitrary symbols is unfounded."[61] Liddell further argues that iconicity is desirable and that languages strive for it wherever possible. He makes the case that spoken languages do indeed exhibit iconicity when there is opportunity to do so. For example, the words used to name the letters of the English alphabet ([eɪ] for *a*, [bi] for *b*, [si] for *c*, and so on) are largely iconic, because they bear a physical resemblance to the sound of the letters when they appear in English words.[62] From this point of view, sign languages contain more iconic elements because languages contain as many as possible, and more are possible in sign languages.

The debate on iconicity in languages is likely not over. Whatever the resolution to the debate, sign languages certainly play a central role. Now that we accept that sign languages are languages, the issue of iconicity must be addressed in some manner. Examination of iconicity in sign languages has brought our attention to the fact that Western linguistics' bias against the iconic is in fact an ideologically based assumption that needs further review and scrutiny. If Liddell is correct and languages strive for iconicity whenever possible, this has profound implications for the way that we as humans think about and organize the world around us. Because the spoken modality allows far fewer opportunities for iconic words, this possibility may never have come to light without sign languages. Linguistics and related fields such as anthropology, communications, education, and psychology stand to gain significantly from this line of research. The Deaf Gain here is similar to the concept of Deaf Gain itself: an ideological construct has been flipped on its head, thanks to the presence of sign languages.

Refuted Ideology III: Gesture Is "Paralinguistic"

Tied up with these ideologies about sign language are ideological frameworks about the nature of gestures and the relationship of gestures to language. Gesturing has a negative reputation in Western culture, and in linguistic studies gesture is generally "dismissed as irrelevant,"[63] demonstrating that this ideology impacts

linguistic research. David McNeill argues that the bias against gesture is rooted in writing, arguing that "[o]ne thinks of sentences in terms of what can be easily *written* down; anything that cannot be *written* down we tend to regard as not part of the sentence."[64] Similarly, Bonnie Urciuoli notes that "especially privileged are the most text-like aspects of speech."[65] Because they cannot be written, linguistic elements such as gesture and prosody are relegated to the position of "paralinguistics." Similarly, Douglas Baynton notes that historically, gesticulation has been erroneously associated with "savage" peoples.[66] Armstrong and Wilcox point out that "claims about the inferiority of signed languages have been based to some extent on the gestural origin theories."[67] The association of gesturing with "savage" people and the assumption that if gestures preceded spoken words, they must somehow be inferior to spoken words, feed the negative image of gestures. If this is the case, then it is easy to see why early sign linguists would avoid acknowledging any possible gestural components in sign languages. Sign-language linguists have thus had to contend not only with ideologies about ASL and deafness but also with ideologies of gesture, because gesture uses the same modality (they are both manual and visual) as sign languages.

Anthropological research on sign languages also brings into sharp focus the ideology that separates the "linguistic" from the "paralinguistic." One way to demonstrate this is with cross-cultural data on the nature of gesture. Brenda Farnell contrasts the way the Western linguistic tradition views language with the way her informants among the Assiniboine view language. Farnell's informants used both spoken Assiniboine and Plains Sign Language. Whereas linguistics generally labels things such as gesture, facial expression, and body movements as paralinguistic, this is not the case with the Assiniboine she interviewed. Informants referred to what Westerners would likely label gestures as "words." No fixed boundary exists in Assiniboine culture between their spoken language and Plains Sign Language, though either can be used independently if need be. This is significant when we consider arguments by linguists such as McNeill that gesture is more a part of spoken language than was previously believed. By providing an example of a culture that considers gesture integral to language, Farnell demonstrates how linguists' focus on certain aspects of language at the expense of others is itself an ideological construct.[68]

Recent work in linguistics has called into question the assumed peripheral role of gesture in language.[69] McNeill refers to such a viewpoint as a "profound error,"[70] arguing instead that gesture is central to human language. McNeill's research indicates that gesture is important to the human capacity for language: blind children gesture even with each other, gestures seem to "inoculate" against stuttering, and coexpressive gestures are not the same as stand-alone gestures. Central to McNeill's argument is his theory that "language is insuperable from imagery."[71] If this is the case, then sign languages are uniquely positioned to inform linguistic research because they are so clearly based on imagery.

If gesture is as integral to human language as McNeill suggests, it also addresses the previously discussed issue of iconicity. McNeill argues many gestures are iconic in nature, expressing the shape or movement of objects or entities.[72] If gestures are central to all human communication, then iconic gestures are a large part of spoken language. In much of McNeill's data, the information in iconic gestures is not expressed in speech. This demonstrates that gestures are not a redundant part of the message but contribute information to the message not contained in the spoken words. Gestures are thus a central part of the communication process. Furthermore, if gesture is very much central to language, as McNeill suggests, then the existence of gesture in sign languages is nonproblematic. However, differentiating between gesture and sign in sign languages proves rather difficult. Liddell suggests that there are many signs that simultaneously contain a linguistic element and a gestural element. Such signs combine linguistic rules, such as the hand shape, with a gestural element, the direction of the verb, which varies considerably based on the signer's spatial environment, as well as other factors.[73] Some linguists question, however, whether it is easy for us to distinguish between gesture and word in spoken languages either. Susan Duncan considers anything with a gradient pattern, no matter what the mode, to be included in the category of gesture. This would include gradient vocal features, such as prosody, as well as gradient hand movements.[74] Some linguists have gone so far as to argue that vocal speech is in and of itself gesture.[75] If gesture is conceived of in this way, looking for or finding gesture in sign language no longer presents an ideological problem, because gesture is a large part of spoken language as well.

The idea that gestures are simple is also flawed. One excellent demonstration of this is the research that has been done on the phenomenon of pointing. Liddell describes attempts by sign-language linguists to downplay pointing in sign language or to recategorize it as something else, whereas he argues that it *is* pointing and there is no need to argue otherwise.[76] Whatever the case, there is nothing simple about pointing. Michael Tomasello's research on pointing indicates that it is something that humans uniquely do. Figuring out what your interlocutor is pointing at and why requires a complex ability to understand your interlocutor's motivations. Tomasello further argues that the cognitive skills that allow us to use and understand language allow us to point and to understand another person's point.[77] Pointing thus shares with the rest of gestures an unfair characterization as simple, when it is far from it.

The comparison of gestures and sign languages can also provide a unique insight into gesture and language, because "[t]he comparison of coded signs [the signs of sign languages] and noncoded spontaneous gestures within the same visual-kinesthetic medium presents a unique view: holding constant the medium, we see what properties are added by the conventionally structured code."[78] Susan Goldin-Meadow's examination of the communication of deaf children with

no exposure to any sign language demonstrates this: "The deaf children in our study gesture like [hearing children]. But the gestures they produce are different from hearing children's—theirs are part of a system. The deaf children use their pointing gestures like hearing children use nouns and pronouns. They use their headshakes like hearing children use negative markers like 'not' and 'can't.' And, unlike hearing children who produce only a few iconic gestures, the deaf children produce many, alone and in combination with other gestures."[79] Though Goldin-Meadow's subjects used similar gestures to those observed by hearing children, they used them in a systematic way that demonstrates the language-making skills available to children even in the absence of a language to learn (her particular subjects were not exposed to sign language). Sign language thus contributes to the understanding of language and gesture in unique ways.

These conclusions about gesture and sign have led many linguists to argue for the role of the visual modality in the evolution of human language. McNeill, for example, argues that gesture and imagery are central to human language development.[80] Corballis and Armstrong and Wilcox point out that a language area of the brain, Broca's area, seems to be activating not only when grasping and pinching but even when watching others do so.[81] This connection between grasping and Broca's area suggests to those authors that language first evolved in visual form. Stokoe argues that it is logical to conclude that prelingual humans first used visual representations of nouns in their environment because of the superiority of the human visual system.[82] Tomasello argues that "the first uniquely human forms of communication were pointing and pantomiming."[83] Similarly, Armstrong argues that human communication has always been inherently multichanneled.[84] In a collaborative work, Armstrong, Stokoe, and Wilcox propose that syntax itself "emerges out of such visual gestural systems."[85] However, as Armstrong points out, the acceptance of such claims seems to be limited to those doing research on sign languages or gesture, and spoken-language linguists "see no role for signed languages in the emergence of language."[86] That these two positions are influenced by ideology seems clear: they depend on the linguist's experience, or lack thereof, with sign languages.

Like that regarding iconicity, debate over the role of gesture in language and in the origins of language is not likely over. However, whether or not these arguments are true, they provide an important alternate paradigm in linguistic thinking for future examination and debate. Sign-language research is integral to this alternate paradigm, because sign languages occur in the same modality as many of the gestures of spoken language. Because these issues deal with the nature of language, human cognition, and the origins of language, they are of central importance both to linguistics and to other scholarly fields that examine human behavior. Our understanding of language and humanity gains from the presence of sign languages.

Conclusion: A World with Many Signs

Research never occurs in a vacuum. It is influenced by the ideologies of researchers and of those around them. Research on sign language is no exception. Researchers examining sign languages have had to contend with ideological ideas about sign language and about language in general. When modern research on sign linguistics began, almost no one saw sign languages as actual languages. Even today, researchers must deal with the lingering doubts of many. Furthermore, ideologies about sign language are tied up with ideologies about iconicity, gesture, and modality. Research on sign languages has helped to demonstrate that these ideas are ideologically based by calling them into question.

The acceptance of sign languages and increase in arguments about the role of iconicity and gesture in language may be closely connected with a paradigm shift in linguistic research. Research on these arguments seems to have taken off in the 1980s, perhaps not coincidentally at the same time that many researchers began questioning the "special" nature of language. Stokoe, for example, positions himself in direct opposition to the dominant model of language championed by Chomsky and even likens the idea of universal grammar to a fairy tale.[87] Armstrong, too, rejects the modular view of human language ability presumed by formalists.[88] Linguists such as Taub identify themselves as cognitive linguists, whom Taub describes as those who "treat the language capacity as a part of the general human cognitive capacity." Viewed from this perspective, iconicity in sign language is a part of the many cognitive processes of humans, like all other aspects of language, and, in the words of Taub, is a "sophisticated process."[89] Just as ideology affected linguists who were trying to prove ASL was a language, later linguists, too, may have been influenced by their theoretical positions. Sign-language research may thus be involved in an important shift away from an old paradigm.

Biological metaphors are often used to describe the quickly decreasing number of languages used by humans today. Many languages are thought of as "dying," and their decreasing diversity is compared to decreasing biological diversity observed among the world's plants and animals. Many fear that, like decreasing biological diversity, decreasing linguistic diversity has the potential to produce many negative effects. Beyond the impact on the population who speaks a dying language (and often wishes to see it continue), the death of a language means a loss of knowledge, cultural heritage, and data to use in the understanding of human language and cognition. Any one language has the potential to disprove theories or even to bring forth data that linguists may not have even considered possible.[90] However, what if we were to lose an entire modality?

As is shown by some of the works reviewed here, sign languages are positioned to make unique contributions to the study of languages. Sign languages challenge presumed notions about the nature of language and reveal such notions as ideologies. Taub predicts that "taking signed languages seriously will cause a revolution

in spoken-language linguistics,"[91] precisely because of the differences between signed and spoken languages. Like spoken languages, many sign languages are in danger of disappearing.[92] The removal of one would be as great a loss as the removal of a spoken language.

Moreover, the scope of this book asks how the presence of deaf people on this planet is beneficial to us all, hearing or deaf. Surely one of the gifts given to us by deaf people is the diversity of sign languages they use. If there had been no deaf people, the vast majority of sign languages never would have existed. Every language is unique, and the loss of any language hurts the field of linguistics. Removing sign languages entirely would mean not just removing a large number of languages from our corpus of knowledge but removing entire language families. The loss to linguistics would be huge.

Notes

1. Carol Padden, "Translating Veditz," *Sign Language Studies* 4, no. 3 (2004): 245.
2. H-Dirksen L. Bauman and Joseph Murray, "Reframing: From Hearing Loss to Deaf-Gain," *Deaf Studies Digital Journal* 1 (2009).
3. Ibid.
4. Carol Padden and Tom Humphries, *Deaf in America: Voices from a Culture* (Cambridge, Mass.: Harvard University Press, 1988); Carol Padden and Tom Humphries, *Inside Deaf Culture* (Cambridge, Mass.: Harvard University Press, 2005); Leo Jacobs, *A Deaf Adult Speaks Out* (Washington, D.C.: Gallaudet University Press, 1978); Harlan Lane, *The Mask of Benevolence: Disabling the Deaf Community* (San Diego: Dawn Sign Press, 1999); Susan Burch, *Signs of Resistance: American Deaf Cultural History, 1900 to World War II* (New York: New York University Press, 2002); Harlan Lane, Robert Hoffmeister, and Ben Bahan, *Journey into the Deaf-World* (San Diego: Dawn Sign Press, 1996).
5. Teresa Blankmeyer Burke, "Bioethics and the Deaf Community," in *Signs and Voices: Deaf Culture, Identity, Language, and Arts*, ed. Kristin Lindgren, Darlene DeLuca, and Donna Jo Napoli (Washington, D.C.: Gallaudet University Press, 2008).
6. Bauman and Murray, "Reframing," 5.
7. Kathryn Woolard, "Language Ideology as a Field of Inquiry," introduction to *Language Ideologies: Practice and Theory*, ed. Bambi Schieffelin, Kathryn Woolard, and Paul Kroskrity (New York: Oxford University Press, 1998).
8. Antonio Gramsci, *A Gramsci Reader: Selected Writings, 1916–1935*, ed. David Forgacs (London: Lawrence & Wishart, 1988); Norman Fairclough, *Language and Power* (London: Longlan Group, 1989).
9. Judith Irvine, "When Talk Isn't Cheap: Language and Political Economy," *American Ethnologist* 16, no. 2 (1989).
10. Woolard, "Language Ideology as a Field of Inquiry."
11. Michael Silverstein, "Language Structure and Linguistic Ideology," in *The Elements: A Parasession on Linguistic Units and Levels*, ed. Paul R. Clyne, William Hanks, and Carol Hofbauer (Chicago: Chicago Linguistic Society, 1979).
12. Susan Philips, "Language Ideologies in Institutions of Power: A Commentary, in Language Ideologies; Practice and Theory," in Schieffelin, Woolard, and Kroskrity, *Language Ideologies*.
13. Charles Briggs, "You're a Liar—You're Just like a Woman! Constructing Dominant Ideologies of Language in Warao Men's Gossip," in Schieffelin, Woolard, and Kroskrity, *Language Ideologies*.
14. Bernard Perley, "Contingencies of Emergence: Planning Maliseet Language Ideologies," in

Native American Language Ideologies; Beliefs, Practices, and Struggles in Indian Country, ed. Paul Kroskrity and Margaret Field (Tucson: University of Arizona Press, 2009).

15. Judith Irvine and Susan Gal, "Language Ideology and Linguistic Differentiation," in *Regimes of Language: Ideologies, Polities, and Identities*, ed. Paul Kroskrity (Santa Fe, N.M.: School of American Research Press, 2000).
16. Ibid.
17. Brenda Farnell, *Do You See What I Mean? Plains Indian Sign Language and the Embodiment of Action* (Austin: University of Texas Press, 1995).
18. Marcyliena Morgan, "Theories and Politics in African American English," *Annual Review of Anthropology* 23, no. 1 (1994).
19. William Stokoe, *Sign Language Structure: An Outline of the Visual Communication System of the American Deaf,* Studies in Linguistics: Occasional Papers 8 (Buffalo, N.Y.: Dept. of Anthropology and Linguistics, University of Buffalo, 1960).
20. Scott Liddell, "Modality Effects and Conflicting Agendas," in *The Study of Signed Languages: Essays in Honor of William C. Stokoe,* ed. David F. Armstrong, Michael A. Karchmer, and John Vickrey Van Cleve (Washington, D.C.: Gallaudet University Press, 2002).
21. Ibid., 58.
22. Leila Monaghan, "Signing, Oralism, and the Development of the New Zealand Deaf Community: An Ethnography and History of Language Ideologies" (PhD diss., UCLA, 1996); Richard Senghas and Leila Monaghan, "Signs of Their Times: Deaf Communities and the Culture of Language," *Annual Review of Anthropology* 31 (2002); Barbara Kannapell, "The Power Structure in the Deaf Community," in *Deaf Studies III: Bridging Cultures in the Twenty-First Century; Conference Proceedings* (Washington, D.C.: College of Continuing Education, Gallaudet University, 1993).
23. Brenda Brueggemann, *Deaf Subjects: Between Identities and Place* (New York: New York University Press, 2009).
24. Sherman Wilcox, "Academic Acceptance of American Sign Language," introduction to *Academic Acceptance of American Sign Language,* ed. Sherman Wilcox (Burtonsville, Md.: Linstok, 1992); Phyllis Wilcox and Sherman Wilcox, "American Sign Language," in *Handbook of Undergraduate Second Language Education,* ed. J. Rosenthal (Mahwah, N.J.: Erlbaum, 2000); Paul Chapin, "American Sign Language and the Liberal Arts Education," in S. Wilcox, *Academic Acceptance;* Katrina Miller, "American Sign Language: Acceptance at the University Level," in *Language, Culture, and Curriculum* 21, no. 3 (2008).
25. Liddell, "Modality Effects and Conflicting Agendas."
26. Robbin Battison, "Phonological Deletion in American Sign Language," *Sign Language Studies* 5, no. 1 (1974): 58 (Battison's emphasis).
27. Edward Klima and Ursula Bellugi, *The Signs of Language* (Cambridge, Mass.: Harvard University Press, 1979), 2.
28. Lynn Friedman, introduction to *On the Other Hand: New Perspectives on American Sign Language,* ed. Lynn Friedman (New York: Academic Press, 1977), 1.
29. Robert Ingram, "Theme, Rhyme, Topic, and Comment in the Syntax of American Sign Language," *Sign Language Studies* 20 (Fall 1978).
30. David Crystal and Elma Craig, "Contrived Sign Language," in *Sign Language of the Deaf: Psychological, Linguistic, and Sociological Perspectives*, ed. I. M. Schlesinger and Lila Namir (New York: Academic Press, 1978).
31. Carol Padden, "Some Arguments for Syntactic Patterning in American Sign Language," *Sign Language Studies* 32 (1981): 239.
32. James Woodward, "Language Continuum: A Different Point of View," in *Sign Language Studies* 2, no. 1 (1973): 2.
33. Kathryn Woolard and Bambi Schieffelin, "Language Ideology," *Annual Review of Anthropology* 23 (1994).
34. Senghas and Monaghan, "Signs of Their Times."

35. Richard Dodge, "The Sign Language—Wonderful Expertness of Indian Sign Talkers," in *Our Wild Indians: Thirty-Three Years' Personal Experience among the Red Men of the Great West* (1882), reprinted in *Aboriginal Sign Language of the Americas and Australia,* ed. D. Jean Umiker-Seabock and Thomas Seabock, vol. 2 (New York: Plenum Press, 1978); Juliet Axtell, "The Indian Sign Language," in *The Indian Sign Language and the Invention of Lewis F. Hadley, as Applied to the Speedy Christian Civilization and Education of the Wild Adult Indian* (Chicago: Western Label, 1891), reprinted in Umiker-Seabock and Seabock, *Aboriginal Sign Language of the Americas and Australia,* vol. 2; Gerrick Mallery, "The Gesture Speech of Man," *Proceedings of the American Association for the Advancement of Science* 30 (1881), reprinted in Umiker-Seabock and Seabock, *Aboriginal Sign Language of the Americas and Australia,* vol. 1; Walter Webb, "The Sign Language of the Plains Indians," in *The Great Plains* (Boston: Ginn, 1931), reprinted in Umiker-Seabock and Seabock, *Aboriginal Sign Language of the Americas and Australia,* vol. 2; John Harrington, "The American Indian Sign Language," *Indians at Work* 5 (1938), reprinted in Umiker-Seabock and Seabock, *Aboriginal Sign Language of the Americas and Australia,* vol. 2; Jerrell Walker, "The Sign Language of the Plains Indians of North America," *Chronicles of Oklahoma* 31 (1954), reprinted in Umiker-Seabock and Seabock, *Aboriginal Sign Language of the Americas and Australia,* vol. 2, 168–77.
36. Woolard and Schieffelin, "Language Ideology," 55–82.
37. Jan Bloomaert and Jef Verschueren, "The Role of Language in European Nationalist Ideologies," in Schieffelin, Woolard, and Kroskrity, *Language Ideologies.*
38. Padden and Humphries, *Deaf in America;* Padden and Humphries, *Inside Deaf Culture;* Lane, Hoffmeister, and Bahan, *Journey into the Deaf-World;* Douglas Baynton, "Beyond Culture: Deaf Studies and the Deaf Body," in *Open Your Eyes: Deaf Studies Talking,* ed. H-Dirksen L. Bauman (Minneapolis: University of Minnesota Press, 2008); Harlan Lane, "Ethnicity, Ethics, and the Deaf World," in *Deaf Studies Today: A Kaleidoscope of Knowledge, Learning, and Understanding,* ed. Bryan Eldridge, Doug Stringham, and Minnie Mae Wilding-Diaz (Orem: Utah Valley University, 2004); Susan Rutherford, "The Culture of American Deaf People," in S. Wilcox, *Academic Acceptance of American Sign Language.*
39. Padden and Humphries, *Deaf in America;* Padden and Humphries, *Inside Deaf Culture;* Senghas and Monaghan, "Signs of Their Times," 69–97; Kannapell, "The Power Structure in the Deaf Community"; Rutherford, "The Culture of American Deaf People."
40. Karen Nakamura, *Deaf in Japan: Signing and the Politics of Identity* (Ithaca, N.Y.: Cornell University Press, 2006).
41. Richard Senghas, "New Ways to Be Deaf in Nicaragua: Changes in Language, Personhood, and Community," in *Many Ways to Be Deaf: International Variation in Deaf Communities,* ed. Leila Monaghan et al. (Washington, D.C.: Gallaudet University Press, 2003).
42. Bauman and Murray, "Reframing."
43. David Armstrong, "Scientific and Ethical Issues in the Case for American Sign Language," *Sign Language Studies* 43 (1984): 181.
44. Farnell, *Do You See What I Mean?*
45. Mark Mandel, "Iconic Devices in American Sign Language," in Friedman, *On the Other Hand,* 61.
46. Sarah Taub, *Language from the Body: Iconicity and Metaphor in American Sign Language* (New York: Cambridge University Press, 2001), 507.
47. Sherman Wilcox, "Cognitive Iconicity: Conceptual Spaces, Meaning, and Gesture in Signed Languages," *Cognitive Linguistics* 15, pt. 2 (2004).
48. Battison, "Phonological Deletion in American Sign Language."
49. Harry Hoemann, "The Transparency of Meaning of Sign Language Gestures," *Sign Language Studies* 7 (1975): 151.
50. Clayton Valli and Ceil Lucas, *Linguistics of American Sign Language: An Introduction* (Washington, D.C.: Gallaudet University Press, 1995), 6.

51. I. Breger, "Perception of Sign Language of the Deaf," *Perceptual and Motor Skills* 31, no. 2 (1970).
52. Klima and Bellugi, *The Signs of Language,* 30.
53. Nancy Frishberg, "Arbitrariness and Iconicity: Historical Change in Sign Language," *Language* 51, no. 3 (September 1975).
54. John Haiman, ed., *Iconicity in Syntax: Proceedings of a Symposium on Iconicity in Syntax* (Philadelphia: Benjamins, 1985); Rafaele Simone, ed., *Iconicity in Language* (Amsterdam: Benjamins, 1995).
55. James H-Y. Tai, "Temporal Sequence and Chinese Word Order," in Haiman, *Iconicity in Syntax.*
56. Dwight Bolinger, "The Inherent Iconism of Intonation," in Haiman, *Iconicity in Syntax.*
57. S. Wilcox, "Cognitive Iconicity," 122.
58. Mandel, "Iconic Devices in American Sign Language," 61, 62.
59. Taub, *Language from the Body,* 3.
60. Tommaso Russo, "Iconicity and Productivity in Sign Language Discourse: An Analysis of Three LIS Discourse Registers," *Sign Language Studies* 4 (Winter 2004).
61. Liddell, "Modality Effects and Conflicting Agendas," 65.
62. Ibid.
63. John Haviland, "Gesture," in *A Companion to Linguistic Anthropology,* ed. Alessandro Duranti (Malden, Mass.: Wiley Blackwell, 2004), 197.
64. David McNeill, *Psycholinguistics: A New Approach* (New York: Harper & Row, 1987), 19 (emphasis in original).
65. Bonnie Urciuoli, "The Indexical Structure of Visibility," in *Human Action Signs in Cultural Context: The Visible and the Invisible in Movement and Dance*, ed. Brenda Farnell (Metuchen, N.J.: Scarecrow, 1995).
66. Douglas Baynton, *Forbidden Signs: American Culture and the Campaign against Sign Language* (Chicago: University of Chicago Press, 1996).
67. David Armstrong and Sherman Wilcox, *The Gestural Origin of Language* (New York: Oxford University Press, 2007).
68. Farnell, *Do You See What I Mean?*
69. David McNeill, *Gesture and Thought* (Chicago: University of Chicago Press, 2005); David McNeill, *Hand and Mind: What Gesture Reveals about Thought* (Chicago: University of Chicago Press, 1996).
70. McNeill, *Gesture and Thought,* 4.
71. Ibid.
72. Ibid.
73. Scott Liddell, "Blended Spaces and Deixis in Sign Language Discourse," in *Language and Gesture*, ed. David McNeill (Cambridge: Cambridge University Press, 2000).
74. Susan Duncan, "Gesture in Signing: A Case Study from Taiwan Sign Language," *Language and Linguistics* 6 (2005).
75. David Armstrong, William Stokoe, and Sherman Wilcox, *Gesture and the Nature of Language* (Cambridge: Cambridge University Press, 1995).
76. Liddell, "Modality Effects and Conflicting Agendas," 65.
77. Michael Tomasello, *Origins of Human Communication* (Cambridge, Mass.: MIT Press, 2008).
78. McNeill, *Hand and Mind.*
79. Susan Goldin-Meadow, *The Resilience of Language: What Gesture Creation in Deaf Children Can Tell Us about How All Children Learn Language* (New York: Psychology Press, 2003), 71.
80. McNeill, *Gesture and Thought.*
81. Michael Corballis, *From Hand to Mouth: The Origins of Language* (Princeton: Princeton University Press, 2002); Armstrong and Wilcox, *The Gestural Origin of Language.*
82. William C. Stokoe, "Sign and Speech," *Sign Language Studies* 93 (1996).

83. Tomasello, *Origins of Human Communication*.
84. David Armstrong, *Original Signs: Gesture, Signs, and the Sources of Language* (Washington, D.C.: Gallaudet University Press, 1999).
85. Armstrong, Stokoe, and Wilcox, *Gesture and the Nature of Language*, 198.
86. Armstrong, *Original Signs*, 21.
87. Corballis, *From Hand to Mouth*.
88. Armstrong, *Original Signs*.
89. Taub, *Language from the Body*, 353.
90. David Harrison, *When Languages Die: The Extinction of the World's Languages and the Erosion of Human Knowledge* (New York: Oxford University Press, 2007).
91. Taub, *Language from the Body*, 231.
92. Harrison, *When Languages Die*.

III

LANGUAGE **GAINS** IN ACTION

8

ADVANTAGES OF LEARNING A SIGNED LANGUAGE

PETER C. HAUSER AND GEO KARTHEISER

Pierre Desloges wrote in 1779, in the first book known to be published by a deaf person, that he could not understand why everyone did not learn a signed language, given all the apparent benefits of learning one.[1] At the same time, French philosopher Étienne Condillac also suggested teaching sign not only to deaf children but also to hearing children.[2] However, the cognitive advantages of learning a signed language were not documented until the late twentieth century, partially because it was not until the 1960s when scholars began to accept that signed languages are natural languages. It all started when William Stokoe, a Gallaudet University English professor, noticed that there were grammatical patterns appearing in the gestures of American Sign Language (ASL) that were similar to those of spoken languages.[3] Since then, scholars have studied different signed languages around the world and determined that they in fact have all the characteristics of natural languages. The linguistic features of natural languages, such as phonology, morphology, and syntax, are found in signed languages.[4]

The research of Laura-Ann Petitto, an educational neuroscientist and the science director of the National Science Foundation's Science of Learning Center on Visual Language and Visual Learning (VL2) at Gallaudet University, and her colleagues has shown that exposure to language, whether it be spoken or signed, activates the classic language-oriented brain tissue in hearing babies.[5] Petitto and others have also found that deaf and hearing babies raised in signing households achieve developmental language milestones at the same age-appropriate times that hearing children achieve spoken-language milestones.[6] Deaf babies learn their first signs around the same time that other babies learn their first spoken words. The first two-word sentences also appear in signed and spoken languages at the same developmental stage. The brain has the ability to learn languages regardless of the modality used, visual or auditory, which means learning to sign or speak is really about learning a language.

Cognitive neuroscientists such as Daphne Bavelier, along with her colleagues, used neuroimaging technology (fMRI) to compare ASL and English processing in deaf and hearing native adult signers.[7] They found that the classic area in the left

hemisphere of the brain that is typically used for processing spoken language is also used for processing sign language. This suggests that the areas of the brain responsible for language process language independent of the modality (spoken or signed) of the language. They also found that processing of ASL involves some of the right hemisphere as well. Follow-up studies by Aaron Newman and colleagues revealed that specific areas in the right hemisphere of the brain are used for processing inflectional morphology, narratives, and prosody in ASL, some of which are the same areas used in spoken languages and some of which are not.[8] Older studies on deaf signers with right-hemisphere strokes also illustrated that the right hemisphere involves the use of spatial syntax and classifier constructs in signed languages.[9]

Some of the surface aspects of signed languages require visuospatial processing. As a result, signed languages utilize some parts of the brain, particularly in the right hemisphere, that are not exercised (or at least not to the same extent) by spoken languages. Learning a signed language, therefore, has some linguistic and nonlinguistic cognitive gains that are recognized here as "sign gains." Sign gains are overlooked in many research studies and are often "misinterpreted" as a hearing-status effect. When scientists compare deaf signers with hearing nonsigners and discover differences between the two groups, it is not clear whether the differences are due to hearing status or signing skills (or a combination of both). To truly identify sign gains, studies must find that both deaf signers and hearing signers perform better than deaf and hearing nonsigners on a specific cognitive skill.

There have been some studies on the impact of sign-language competency since the 1980s. Experimental studies on the cognitive functioning in signers' brains have shown that signers perform better in some areas of face, memory, and motion processing. Each of these gains is discussed in depth here with a description of the studies that show its effects. Although the focus is placed on particularly the advantages for all people, regardless of hearing status, there are some advantages that are specific to deaf children and adults. These specific advantages are discussed in the last part of the chapter, along with the implications of Sign Gain in research and practice.

Face-Processing Advantages

A person who is not familiar with signed languages might think that signs are made with the hands and arms only. The face plays an important role in the production of sign-language utterances, including phonological, morphological, lexical, syntactical, and prosodic features. To interpret appropriate linguistic information from the face, signers must be able to rapidly identify many different features and expressions during language comprehension. Eye-tracking studies have found that fluent signers focus on the face when engaged in a conversation or perceiving signed language instead of following the hands.[10] A number of studies since the

1980s have investigated whether signers have some superior face-processing skills because of their frequent attention to and processing of facial features.

One way to test face processing is to determine whether signers have a better ability to recognize faces than nonsigners. Studies began this investigation using the Benton Test of Facial Recognition.[11] It was a multiple-choice test in which each page (item) had a picture of a person at the top; at the bottom, the same person appeared along with other people. The person at the top was shown in a lighting condition, angle, or both that were different from the depiction at the bottom. The test taker had to identify where the person at the top of the page appeared again at the bottom of the page. Ursula Bellugi and her colleagues from the Salk Institute for Biological Studies found that deaf children between the ages of six and nine performed better on the Benton Test than their hearing age-peers who did not know sign.[12] However, it remained unclear whether the advantage was due to sign-language competency or hearing status.

In 1992, Jeffrey Bettger's doctoral dissertation investigated whether deaf signers' enhanced performance on the Benton Test was due to sign competency.[13] He found that hearing signers performed as well as deaf signers on the Benton Test, and both groups performed better than hearing nonsigners. In a follow-up study, Ila Paranis and colleagues found that deaf nonsigners did not perform as well as hearing and deaf signers on the Benton Test.[14] Bettger and his colleagues further investigated whether signers' advanced performance on the Benton Test was specifically related to face processing or whether signers were better at processing objects in general. The Benton Test was then given to deaf signers and hearing nonsigners with the faces flipped upside down. The participants had to find the upside-down face on the top of the page among a sample of upside-down faces depicted on the lower half of the page. Signers and nonsigners performed similarly in this condition; Bettger and colleagues concluded that the impact of signed-language competency on the mechanism of discrimination is limited to faces, not objects, in their upright, everyday position.[15]

Although the Benton Test was developed to measure face recognition, a sign-language neurolinguist, Karen Emmorey, claimed that it is actually a visual-discrimination test.[16] Emmorey pointed out that the test did not require the participants to exercise any of their memory skills, which would have been involved in any task requiring recognition. Instead, it required participants to discriminate between faces, as they had to single out the target face among a group of other faces. Stephen McCullough, a deaf neuroscientist, worked with Emmorey to investigate whether signers actually have better face-recognition skills. They used the Warrington Recognition Memory Test for Faces to answer their question. In that test, participants were asked to view fifty faces and mark each as either "pleasant" or "unpleasant" so that participants would not realize they had to memorize the faces. At random intervals, the participants would be asked to recall which face they last saw. Deaf signers and hearing nonsigners performed

equally well, suggesting that the demanding nature of signed language for gathering linguistic information from the face affects not facial recognition but attention to facial features.[17]

Now it was clear that signers attend to facial detail better than nonsigners, but it remained unclear whether sign-language competency had a positive impact on the processing of the local features (eyes, nose, or mouth) or global features (whole face, head, neck) of the face. To investigate this, McCullough and Emmorey gave the Mooney Faces Closure Test to signers and nonsigners. Participants had to categorize pictures of human faces that were highly contrasted (so that the local facial features became unrecognizable, leaving only global features detectable) into groups based on age (young, old) or gender (male, female).[18] Signers and nonsigners did not perform differently on this task, suggesting that the discriminating advantages of facial processing in sign language most likely are limited to specifically local facial features.

McCullough and Emmorey were keen to investigate which local facial feature was most salient to signers when it came to discrimination.[19] They gave a group of deaf signers and hearing nonsigners a test in which they were presented with a target face for a few seconds and then were given two faces to choose from as a response to the target face. The two faces were identical to the target faces with one exception: one of the local facial features (nose, eyes, or mouth) of one of the two faces had been replaced with a new feature. With one of the two faces slightly altered, the participants had to report which of the two shown faces matched the target face. Hearing and deaf signers excelled in performance when the eyes were changed; they had higher accuracy than nonsigners. Only the deaf signers had greater accuracy with the mouth feature. All groups did not differ in accuracy when the nose was altered.

Naomi Goldstein and Robert Feldman speculated that since signed language extracts linguistic information from the face, it could impact the ability to recognize emotional facial expressions as well. To put their hypothesis to a test, hearing signers and nonsigners were asked to watch a videotape of people expressing spontaneous emotions and then to identify facial expressions with emotional labels (happy, sad, angry, and so on). All participants performed equally well at recognizing happy faces, but signers were better at recognizing two specific facial expressions: disgusted and angry.[20] Elaborating upon the study on facial-expression recognition, Goldstein, James Sexton, and Feldman produced an experiment that tested hearing signers' and nonsigners' ability to express emotions through the face.[21] The participants were filmed producing different facial expressions that were eventually shown to untrained judges. The judges, who had no knowledge of ASL, were able to correctly identify the emotional facial expressions produced by hearing signers better than those produced by hearing nonsigners.

Overall, there are clear advantages of learning a signed language in relation to face processing. Signers fixate on the face during sign-language discourse and

develop enhanced skills in discriminating eye features and, for deaf signers, mouth features. This specialized attention to facial features has enabled signers to perform better than nonsigners on the Benton Test whether they are deaf or hearing, children or adult, and native or nonnative signers. These enhanced face-processing abilities are a gain obtained through learning a signed language, hence an example of a Sign Gain.

Memory-Processing Advantages

Memory is involved in language processing. A person coming up with a sentence has to remember what he or she wants to say, the words to use, and the situation in which the sentence will be shared. Similarly, a person listening to someone talking needs to remember what was said and to build a mental "image" or story (requiring short-term memory) about what is being told. In the case of signed-language utterances, there are often spatial markers in the signer's space or environment that are a part of the story. There are visual aspects of utterances constructed in signed language, so visual memory is involved in comprehension. Sometimes signers talk about something from their own perspectives, thus forcing the listeners to mentally "rotate" the information (requiring visual working memory) so that they "get" the signer's perspective. Cognitive experiments that have investigated memory advantages of sign-language competency have shown that signers, compared to nonsigners, perform better on tasks that involve spatial memory, visual working memory, and image generation. Signed-language processing "exercises" these cognitive functions and makes them "stronger" to a point where these cognitive functions are improved even when processing nonlinguistic information.

Spatial memory is a specific type of visual short-term memory, and it is used when one imagines spatial images in short-term memory. Spatial images are simple representations of how objects are arranged in space, whereas visual images carry information in regard to what the object looks like. An example of a spatial image is imagining the layout of your bedroom, visualizing where each piece of furniture is set in relation to the others (regardless of what the furniture looks like). Spatial images are created frequently in signed-language utterances. Signers use their signing space to represent spatial images or to show spatial relations between objects. In other words, using and understanding a sign language "exercises" an individual's spatial memory frequently. Signed language's strong relation to spatial images prompted researchers to investigate whether signers have better spatial memory than nonsigners.

The Corsi Blocks Task is used in experiments to measure individuals' spatial-memory span. An individual's spatial span represents how many different spatial objects or locations an individual can hold in short-term memory at once. The task involves a board with blocks glued on in a random order. The experimenter taps a sequence of blocks, and the participant has to repeat the tapping sequence. The number of blocks involved in the tapping sequences increases through the test.

The number of blocks a participant can remember before failing is considered his or her spatial span.

An elementary school in Italy taught hearing children Lingua dei Segni Italiana (Italian Sign Language) as a part of their regular curriculum. A team of researchers compared hearing children from that school who had studied signed language for a year with hearing children from the same school who had no sign-language knowledge. They found that the children with one year of signed-language training had significantly greater spatial spans.[22] In another study, it was found that deaf children in India who did not know signed language did not have a longer spatial span than hearing nonsigners.[23] Taken together, these studies suggest that learning a signed language enriches an individual's spatial memory.

Visual working memory is used when one holds visual information (that one is attending to at the moment) in short-term memory and does something (work) with that visual information (such as mentally move it around, take it apart, or manipulate it). The visual information in the short-term memory may be spatial (involving an object in space) or the visualization of a two-dimensional or three-dimensional object. One way to test visual working memory is to give a test called mental rotation. A complex three-dimensional shape is shown to the test taker; then the same shape is rotated into a different position and shown to the test taker along with a few other shapes that do not match the original shape. The test taker has to mentally rotate the original shape to figure out which choice matches the original shape even though it is in a different position, perspective, or orientation.

A deaf researcher, David McKee, was the first to give the mental-rotation test to deaf and hearing participants in research for his doctoral dissertation.[24] The participants were shown three rotated shapes and were asked to choose which two of the three shapes were the same. McKee's study showed that deaf signers performed the mental-rotation task better than hearing nonsigners. Karyn Talbot and Richard Haude wanted to know whether the level of sign-language competency had an impact on visual working memory. They administered the mental-rotation test to hearing signers with one year or less experience in signing and to hearing signers with six years or more experience in signing. Hearing signers with more sign experience were found to perform better on the mental-rotation task than hearing signers with less experience.[25] To further illustrate that sign-language competency alone supplements visual working memory, Charlene Chamberlain and Rachel Mayberry found that deaf nonsigners perform equally well on the mental-rotation task as hearing nonsigners.[26]

The idea that signers perform better on visual-working-memory tasks was similarly found in a study conducted in Japan. Nobuo Masataka found that when the letter *p* was traced on deaf children's bodies, they were more likely to identify the correct letter than their hearing nonsigning peers.[27] The hearing nonsigning children tested in Masataka's experiment were three times more likely to make a

mirror-reversed error (such as *d* for *b*). It was also discovered in this study that the breadth of sign vocabulary had a corresponding effect on the likelihood of accurately transforming what was being written on the deaf children's bodies.

Building an image of the story or information being told in signed language is an important part of processing signed language. To test the impact of signed language on image generation, Emmorey, Stephen Kosslyn, and Ursula Bellugi developed a task in which deaf and hearing participants were shown a matrix of solid and empty cells, with the solid cells forming an uppercase letter. The participants were asked to remember what the uppercase letters looked like and the cells they covered when positioned into the matrices. The participants were then shown a lowercase letter and a matrix of squares with an *X* in one of its cells. The participants were asked to verify as quickly as possible whether the uppercase form of the letter (for example, if *g* was shown, then participants were to imagine *G*) previously covered the space where the *X* now was. The participants were given multiple trials with ten different letters. The study found that deaf and hearing signers performed equally on accuracy when compared with hearing nonsigners, but both deaf and hearing signers were able to respond faster than hearing nonsigners.[28] Emmorey theorized that signers' superior performance on mental-rotation tasks might be partially due to their faster image generation along with enhanced skills in reversal transformations and longer spatial span rather than the ability to rotate images faster.[29]

Motion-Processing Advantages

The movements of signs represent significant aspects of sign-language phonology (comparable to vowels in spoken language). When movements of signs are recognized, along with the other sign phonology features, the sign itself is then identified. Variations in movement also have narrative and prosodic components in sign-language processing. The subtle differences in the movement patterns of signed languages change the meaning of what is being expressed. Given that sign-language processing involves attention to movements, some researchers have questioned whether signers have enhanced ability to categorize subtle differences in motion.

Howard Poizner investigated motion perception in deaf signers and hearing nonsigners. He developed a video with a signer who was affixed with lights on the head, shoulders, joints of the arm, and the index fingertips and who created hand movements containing sign-language linguistic information in a pitch-black room. The video was then shown to deaf signers and hearing nonsigners, and they were asked to identify which two of the three shown movements were most similar. Deaf signers were more sensitive to certain movements in this task than hearing nonsigners, suggesting that sign-language experience might lead to enhancements in motion perception and categorization.[30]

To see whether this was an effect unique and limited to the properties of ASL,

Poizner, Angela Fok, and Bellugi repeated the study with a new population, Chinese Sign Language (CSL) signers and hearing nonsigners. The results of this study showed that CSL users were more sensitive to movement than nonsigners, just as ASL users were, but the types of movement that they were able to uniquely respond to were different. ASL signers were sensitive to the difference between straight and arc movements, whereas CSL signers were sensitive to the difference between straight and circular movements.[31] In other words, sign-language competency does not give individuals enhanced abilities to perceive motions in general, but it gives them enhanced abilities to perceive motions that are linguistically significant to a specific sign language. This is not necessarily true with another signed language, however, as sign languages around the world have some different phonological features, including movements.

Edward Klima and colleagues wanted to investigate whether signed language can alter the way the human brain categorizes movement even when it does not carry linguistic information.[32] They conducted an experiment in which fake Chinese characters were displayed in the air using a light pointer in the dark. The characters were shown to a group of deaf and nonhearing Americans who did not know Chinese. The participants were asked to re-create the characters they saw, and results showed that deaf signers were better at segmenting the strokes in their re-creation of shown characters. Specifically, they were more likely to eliminate the transitional movements, or the motions connecting one segment to the next, in their reproduction. The researchers claimed that this skill was most likely contributed by the nature of ASL to demand discrimination of signs from the transitional movements in between while comprehending what is being said. Taken together, these studies show that learning a sign language enhances an individual's ability to detect and categorize motions. There are more studies to date that could be further investigated for the effect of signed-language and/or hearing status. For example, in 2012, David Corina and Michael Grosvald found in a study that Deaf native signers were about one hundred milliseconds faster at recognizing nonlinguistic gestures (such as stroking the chin) than hearing nonsigners.[33]

Deaf-Education Advantages

Hearing parents from a growing number of countries are purchasing baby-sign materials developed for hearing infants, toddlers, and children. Not only young hearing children are learning signed languages; a rapidly growing number of hearing adolescents and young adults are taking signed-language courses. In the United States, the Modern Language Association found that ASL is the fourth-most-taught language in colleges and universities.[34] However, paradoxically, the parents of deaf children are often discouraged from teaching their children how to sign. They believe that if a deaf child learns a signed language, the child will not be able to learn how to speak or to live independently in what they see as an

auditory-oriented world. This belief is perhaps reasonable, because most parents never met a deaf individual before their deaf children were born.

Ioulia Kovelman, Stephanie Baker, and Petitto's brain research demonstrated that learning a second language does not interfere with the development of the first language, regardless of whether the language is signed or spoken.[35] As a matter of fact, there are additional benefits of learning a signed language that are unique to deaf individuals. Bencie Woll, the director of the Centre on Deafness, Cognition, and Language at University College London, conducted a study on deaf two-year-olds born to hearing parents who were in an early-intervention program that provided sign instruction. Woll found the opposite of what many people have assumed: deaf and hard-of-hearing children who signed more often actually have more spoken vocabulary than those who signed less often. That result includes even children with moderate levels of hearing.[36] The discovery means that both deaf and hard-of-hearing children who learn both speech and sign have a greater vocabulary than if they learned just one language, which in turn allows them to express themselves better. Similarly, in a study in Iran, deaf children with cochlear implants who were exposed to sign language early in life were found to have better speech perception and production than deaf children with cochlear implants who did not know how to sign.[37]

Studies in the United States have shown that learning ASL supports deaf individuals' reading development.[38] Other research has shown that fluency in a signed language facilitates deaf readers' word recognition.[39] A recent study reviewed experiments on deaf readers and found that language competency is the greatest predictor of reading processing.[40] Studies in the United States and the United Kingdom have shown that even teaching a signed language to hearing children helps these children's reading development.[41]

Signed language is important for the development of deaf children's higher cognitive functions and social cognitive skills.[42] This can be illustrated in, for example, "theory of mind" (ToM) research. ToM involves the ability to understand things from a different person's perspective and is often measured by the "false-belief task." Imagine an experiment with a researcher, a boy, and a girl in a room. The researcher has the children watch her put an apple under a box. The researcher then asks the boy to wait outside of the room. After the boy leaves, the researcher removes the apple and places it on the floor. The researcher asks the girl where she thinks the boy who is outside the room thinks the apple is now. The correct answer should be "still under the box." That would illustrate that the girl has a ToM; she is able to think about how the other child thinks. The ability to think about how others may be thinking is an important skill for social interaction and learning.

Research in the United States has shown that deaf children who learned a signed language early in life have ToM development that is the same as that of hearing children. However, deaf young children who have not learned a signed

language or have delayed signed-language development have ToM skills that are comparable to those of hearing children with autism.[43] Research has also shown that hearing parents who sign well have deaf children with better ToM skills compared to deaf children of parents who do not sign.[44] A study in the United Kingdom has found that deaf children with hearing siblings who can sign British Sign Language have better ToM than those with siblings who cannot sign.[45]

In November 2012, the World Federation of the Deaf and the European Union of the Deaf hosted a conference on endangered signed languages in Ål, Norway. There is a worldwide concern that sign languages are becoming endangered. As a growing number of deaf children around the world receive cochlear implants, parents are often told by medical professionals that there is no need for their children to learn a signed language, and some are told even that teaching their children a signed language could interfere with their learning. For example, in Denmark, deaf children are not taught a signed language anymore, because the government assumes that cochlear implants provide deaf children full access to language. Danish Sign Language, because it is not being passed to the younger generation, therefore is at risk of becoming an extinct language in the near future.

Cochlear implants can provide deaf children an awareness of sounds around them and some assistance in learning to hear and speak, but it is not a "cure," as their language development is often delayed.[46] Deaf children with cochlear implants are still deaf children, and their education would be enhanced if they learned how to sign, as suggested by the Iran study mentioned earlier. Studies have found that the earlier the exposure to sign language, the better.[47] If a child does not learn a sign language early in life, the critical window of opportunity slowly closes, and the severity of the consequences on the child's future academic success and psychosocial well-being appears to increase as time passes.[48] The myth that learning sign language is harmful has to end. The deaf community, allies, and scholars need to work collaboratively to share research on Sign Gain to parents, professionals, and policy makers.

Conclusion

Pierre Desloges's observation more than two centuries ago seems correct: it is puzzling that so many people do not know a signed language, given all the apparent advantages it imparts. Learning to sign benefits hearing people in the sense that it strengthens certain higher-order cognitive functions in a way not possible without knowing sign language. Signers have enhanced abilities to discriminate among people's facial features, particularly the features critical to processing linguistic information in signed language: the eyes and the mouth. Signers have greater spatial spans, generate images in their memories faster, are more skilled at rotating images in their minds, and have better discrimination between some motions than nonsigners. These are only examples; there are other areas of cognitive processing in which signers have advantages.

Sign Gain is an advantageous slice of Deaf Gain that is applicable to both deaf and hearing people. There are also cognitive gains for being deaf that are independent from sign-language skills.[49] In studies supporting this conclusion, deaf signers and nonsigners performed better than hearing signers and nonsigners; hence, the gain is related to hearing status, not signing skills. When people discuss Deaf Gain, they might be referring to Deaf Gain or to Sign Gain without specifying which. Nevertheless, we believe that Deaf Gain involves sign gains and that Sign Gain is an advantage that hearing individuals share with deaf individuals.

The recognition of Sign Gain is important. As we have mentioned, sign languages are becoming endangered in some countries. Some deaf children are not being taught a signed language because of the fear that they might have disadvantages. This fear is having a negative impact on many deaf children's social, emotional, and cognitive development. Parents, educators, and medical professionals need to be aware of sign gains to prevent their children's risk of having developmental delays. In fact, all parents, regardless of whether they have deaf children, should be aware of Sign Gain, because learning a sign language is a great brain exercise.

Notes

1. P. Desloges, *Observations d'un sourd et muet: Sur un cours elementaire d'education des sourds et muets, publié en 1779 par M. l'Abbé Deschamps* (Amsterdam: Morin, 1779).
2. É. Condillac, cited in D. Blackburn, J. Bonvillian, and R. Ashby, "Manual Communication as an Alternative Mode of Language Instruction for Children with Severe Reading Disabilities," *Language, Speech and Hearing Services in Schools* 15 (1984): 22–31.
3. W. C. Stokoe, "Sign Language Structure: An Outline of the Visual Communication Systems of the American Deaf," *Journal of Deaf Studies and Deaf Education* 10 (2005): 3–37.
4. For review, see R. P. Meier, K. Cormier, and D. G. Quinto-Pozos, *Modality and Structure in Signed and Spoken Languages* (Cambridge: Cambridge University Press, 2002), 480; and K. Emmorey, *Language, Cognition, and the Brain: Insights from Sign Language Research* (Mahwah, N.J.: Erlbaum, 2002).
5. L.-A. Petitto et al., "Speech-Like Cerebral Activity in Profoundly Deaf People Processing Signed Languages: Implications for the Neural Basis of Human Language," *Proceedings of the National Academy of Science* 97 (2000): 13961–66.
6. Ibid.; and L. A. Petitto, "On the Autonomy of Language and Gesture: Evidence from the Acquisition of Personal Pronouns in American Sign," *Cognition* 27 (1987): 1–52.
7. D. Bavelier et al., "Hemispheric Specialization for English and American Sign Language: Left Invariance, Right Variability," *Neuroreport* 9 (1998): 1537–42.
8. A. J. Newman et al., "Prosodic and Narrative Processing in American Sign Language: An fMRI Study," *NeuroImage* 52, no. 2 (2010): 669–76; A. J. Newman et al., "Dissociating Neural Subsystems for Grammar by Contrasting Word Order and Inflection," *Proceedings of the National Academy of Science* 107, no. 16 (2010): 7539–44.
9. D. P. Corina, "The Processing of Sign Language: Evidence from Aphasia," in *Handbook of Neurology,* ed. H. Whitaker and B. Stemmer (San Diego: Academic Press, 1998), 313–29.
10. D. Agrafiotis et al., "Perceptually Optimized Sign Language Video Coding Based on Eye Tracking Analysis," *Electronic Letters* 39 (2003): 1703–5; K. Emmorey, R. Thompson, and R. Colvin, "Eye Gaze during Comprehension of American Sign Language by Native and Beginning Signers," *Journal of Deaf Studies and Deaf Education* 14 (2009): 237–43; L. J. Muir

and I. E. G. Richardson, "Perception of Sign Language and Its Application to Visual Communications of Deaf People," *Journal of Deaf Studies and Deaf Education* 10 (2005): 390–401.

11. A. L. Benton et al., *Facial Recognition: Stimuli and Multiple Choice Pictures* (New York: Oxford University Press, 1983).
12. U. Bellugi et al., "Enhancement of Spatial Cognition in Deaf Children," in *From Gesture to Language in Hearing and Deaf Children,* ed. V. Volterra and C. Erting (New York: Springer, 1990), 278–98.
13. J. Bettger, "The Effects of Experience on Spatial Cognition: Deafness and Knowledge of ASL" (PhD diss., University of Illinois, Urbana-Champaign, 1992).
14. I. Paranis et al., "Does Deafness Lead to Enhancement of Visual Spatial Cognition in Children? Negative Evidence from Deaf Non-signers," *Journal of Deaf Studies and Deaf Education* 1 (1996): 145–53.
15. J. Bettger et al., "Enhanced Facial Discrimination: Effects of Experience with American Sign Language," *Journal of Deaf Studies and Deaf Education* 2, no. 4 (1997): 223–33.
16. Emmorey, *Language, Cognition, and the Brain.*
17. S. McCullough and K. Emmorey, "Face Processing by Deaf ASL Signers: Evidence for Expertise in Distinguishing Local Features," *Journal of Deaf Studies and Deaf Education* 2 (1997): 212–22.
18. Ibid.
19. Ibid.
20. N. Goldstein, and R. S. Feldman, "Knowledge of American Sign Language and the Ability of Hearing Individuals to Decode Facial Expressions of Emotion," *Journal of Nonverbal Behavior* 20 (1996): 111–22.
21. N. E. Goldstein, J. Sexton, and R. S. Feldman, "Encoding of Facial Expressions of Emotion and Knowledge of American Sign Language," *Journal of Applied School Psychology* 30 (2000): 67–76.
22. O. Capirci et al., "Teaching Sign Language to Hearing Children as a Possible Factor in Cognitive Enhancement," *Journal of Deaf Studies and Deaf Education* 3 (1998): 135–42.
23. Paranis et al., "Does Deafness Lead to Enhancement of Visual Spatial Cognition in Children?"; M. Wilson et al., "Modality of Language Shapes Working Memory: Evidence from Digit Span and Spatial Span in ASL Signers," *Journal of Deaf Studies and Deaf Education* 2 (1997): 150–60.
24. D. McKee, "An Analysis of Specialized Cognitive Functions in Deaf and Hearing Signers" (PhD diss., University of Pittsburgh, 1987).
25. K. F. Talbot and R. H. Haude, "The Relationship between Sign Language Skill and Spatial Visualization Ability: Mental Rotation of Three-Dimensional Objects," *Perceptual and Motor Skills* 77 (1993): 1387–91.
26. C. Chamberlain and R. I. Mayberry, "Theorizing about the Relationship between ASL and Reading," in *Language Acquisition by Eye,* ed. C. Chamberlain, J. Morford, and R. I. Mayberry (Mahwah, N.J.: Erlbaum, 2000), 221–60.
27. N. Masataka, "Absence of Mirror-Reversal Tendency in Cutaneous Pattern Perception and Acquisition of a Signed Language in Deaf Children," *Journal of Developmental Psychology* 13 (1995): 97–106.
28. K. Emmorey, S. Kosslyn, and U. Bellugi, "Visual Imagery and Visual-Spatial Language: Enhanced Imagery Abilities in Deaf and Hearing ASL Signers," *Cognition* 46 (1993): 139–81.
29. Emmorey, *Language, Cognition, and the Brain.*
30. H. Poizner, "Visual and 'Phonetic' Coding of Movement: Evidence from American Sign Language," *Science* 212 (1981): 691–93; H. Poizner, "Perception of Movement in American Sign Language: Effects of Linguistic Structure and Linguistic Experience," *Perception and Psychophysics* 33 (1983): 215–31.
31. H. Poizner, A. Fok, and U. Bellugi, "The Interplay between Perception of Language and Perception of Motion," *Language Sciences* 11 (1989): 267–87.

32. E. S. Klima et al., "From Sign to Script: Effects of Linguistic Experience on Perceptual Categorization" (Technical Report no. INC-9604, Institute for Neural Computation, University of California, San Diego, 1996).
33. D. P. Corina and M. Grosvald, "Exploring Perceptual Processing of ASL and Human Actions: Effects of Inversion and Repetition Priming," *Cognition* 122 (2012): 330–45.
34. N. Furman, D. Goldberg, and N. Lusin, "Enrollment in Languages Other Than English in United States Institutions of Higher Education" (Modern Language Association, 2007), accessed February 4, 2014, http://www.mla.org/pdf/06enrollmentsurvey_final.pdf.
35. I. Kovelman, S. A. Baker, and L.-A. Petitto, "Bilingual and Monolingual Brains Compared: A Functional Magnetic Resonance Imaging Investigation of Syntactic Processing and a Possible 'Neural Signature' of Bilingualism," *Journal of Cognitive Neuroscience* 20 (2008): 153–69.
36. B. Woll, "'Early Spoken and Sign Language Acquisition" (paper presented at the Theoretical Issues in Sign Language Research Conference, Purdue University, 2010).
37. S. Hassanzadeh, "Outcomes of Cochlear Implantation in Deaf Children of Deaf Parents: Comparative Study," *Journal of Laryngology and Otology* 126 (2012): 989–94.
38. Chamberlain and Mayberry, "Theorizing about the Relationship between ASL and Reading"; M. Daniels, "Seeing Language: The Effects Over Time of Sign Language on Vocabulary Development in Early Childhood Education," *Child Study Journal* 26 (1996): 193–208; L. Felzer, "A Multisensory Reading Program That Really Works," *Brain and Cognition* 5 (1998): 169–83.
39. J. P. Morford et al., "When Deaf Signers Read English: Do Written Worlds Activate Their Sign Translations?," *Cognition* 11 (2011): 286–92.
40. R. I. Mayberry, A. A. del Giudice, and A. M. Liberman, "Reading Achievement in Relation to Phonological Coding and Awareness in Deaf Readers: A Meta-analysis," *Journal of Deaf Studies and Deaf Education* 16 (2011): 164–88.
41. M. Daniels, "Happy Hands: The Effects of ASL on Hearing Children's Literacy," *Literacy Research and Instruction* 44 (2004): 86–98; K. Robinson, *Sign in Education: The Teaching of Hearing Children British Sign Language in School* (Birmingham, UK: Teesside Tec Press, 1997).
42. D. Corina and J. Singleton, "Developmental Social Cognitive Neuroscience: Insights from Deafness," *Child Development* 80 (2009): 952–67; P. C. Hauser, J. Lukomski, and T. Hillman, "Development of Deaf and Hard of Hearing Students' Executive Function," in *Deaf Cognition: Foundations and Outcomes*, ed. M. Marschark and P. C. Hauser (New York: Oxford University Press, 2008), 286–308.
43. C. C. Peterson and M. Siegal, "Representing Inner Worlds: Theory of Mind in Autistic, Deaf, and Normal Hearing Children," *Psychological Science* 10 (1999): 126–29.
44. M. P. Moeller and B. Schick, "Relations between Maternal Input and Theory of Mind Understanding in Deaf Children," *Child Development* 77 (2006): 751–66.
45. T. Woolfe, S. C. Want, and M. Siegal, "Siblings and Theory of Mind in Deaf Native Signing Children," *Journal of Deaf Studies and Deaf Education* 8 (2003): 340–47.
46. D. B. Pisoni et al., "Efficacy and Effectiveness of Cochlear Implants in Deaf Children," in Marschark and Hauser, *Deaf Cognition*, 52–101.
47. R. I. Mayberry and E. Lock, "Age Constraints on First versus Second Language Acquisition: Evidence for Linguistic Plasticity and Epigenesis," *Brain and Language* 87 (2003): 369–84; P. Boudreault and R. I. Mayberry, "Grammatical Processing in American Sign Language: Age of First-Language Acquisition Effects in Relation to Syntactic Structure," *Language and Cognitive Processes* 21 (2006): 608–35.
48. D. Bavelier, E. Newport, and T. Supalla, "Signed or Spoken: Children Need Natural Languages," *Cerebrum* 5, no. 1 (2003): 19–32.
49. See M. Dye, "Seeing the World through Deaf Eyes," in this volume.

9

BABY SIGN AS DEAF GAIN

KRISTIN SNODDON

So-called baby-sign programs for hearing infants and their parents are one of the most widely known and lucrative examples of Deaf Gain. Young hearing children who are instructed in signed language show enhanced language and emergent-literacy learning. Recently, the American Academy of Pediatrics stated in its informational materials for new parents that "infant sign language really does deliver on its promise of improved communication."[1] Baby-sign advocates who claim that young children can communicate with signed language or gesture at an earlier age than they can communicate with spoken language often focus on the goal of lessening frustration for infants who are not yet able to verbalize their wishes using spoken language. However, other benefits of young children's learning of signed language include not only the nonlinguistic and linguistic advantages conferred by bilingualism but also distinct contributions to visual and spatial cognitive abilities. These cognitive benefits are manifestations of Deaf people's positive biology, extended to all young children and parents. These benefits are most apparent when children are exposed to native signed languages of the Deaf community instead of nonlinguistic gestural communication or invented signs, which are endorsed by some entrepreneurs. Other baby-sign instructors claim that their programs use "the symbols of American Sign Language, with song and music added, but not the grammar."[2]

In recent decades, the notion of teaching signed language to young hearing children has become a widespread and enduring business phenomenon. But although hearing parents and entrepreneurs are quick to capitalize on the gain that is conveyed by the Deaf community's most treasured resource, support for Deaf children's and their families' learning of signed language has been lacking among many professionals and educators. Without this support, the general public will potentially be less able to benefit from the linguistic and cognitive gain provided by signed languages.

This chapter explores several popular claims that have been made regarding baby sign in the light of existing research evidence. In the next section, I outline some of the history regarding teaching signed languages to hearing children

and historical conceptions of language. I then discuss research studies regarding gestural communication and signed-language input, including the modality-advantage hypothesis, and regarding hearing children's learning of signed language in terms of enhanced vocabulary, literacy, and cognition. Finally, I conclude by discussing the kinds of signed-language programs that might be most advantageous for hearing and Deaf children.

Background and History

Baby-sign programs for infants and young children have become an international industry, with a proliferation of Web sites, books, DVDs, classes, online videos and testimonials, and other marketing tools. Although these programs and resources are most often the creation of hearing educators and entrepreneurs, their origins lie in native signed languages of the Deaf community. Several creators of baby-sign resources, notably Joseph Garcia, have backgrounds in sign-language interpreting and announce that their programs are "based in" American Sign Language (ASL) or other native signed languages.[3] Other entrepreneurs report backgrounds in speech-language pathology or communication disorders, fields often linked to Deaf children. Baby-sign programs are most often advertised as being created for hearing infants and parents, but several resources have included Deaf children in their target market. For example, a blurb for the paperback edition of Garcia's *Sign with Your Baby Complete Learning Kit* states that the work "provides a terrific start in American Sign Language for a hearing-impaired child."[4] Additionally, several service agencies for Deaf adults and children, including Toronto's Bob Rumball Centre for the Deaf, include baby sign as part of their regular programming.[5]

The subject of young hearing children's learning of signed language invariably elicits commentary regarding the origins of language, in terms of both human language's historical origins and infants' earliest language production. Étienne Condillac, who has been cited as one of the first individuals to propose teaching signed language to hearing children,[6] also argued, alongside several of his contemporaries, that human language originated as gesture.[7] This historic notion regarding the gestural origins of language has been frequently accompanied by assertions regarding the "naturalness" of signed languages as compared to spoken languages.[8] This view regarding the primacy and special eloquence of signed language was shared by Thomas Hopkins Gallaudet (1787–1851), who advocated teaching signed language to the hearing siblings of his students at the American School for the Deaf.[9] As Gallaudet believed, learning signed language would increase hearing children's vocabulary and language proficiency,[10] in addition to enhancing the practice of oratory and human communion in general.[11] Today, some evolutionary linguists continue to argue that language originated as gesture.[12] However, Adam Kendon argues that gesture and speech may have developed concomitantly in the earliest human communicative actions and that "language" as a monomodalic

construct that is exclusively spoken or signed may be a latter-day human specialization.[13] In fact, the separation of the spoken and kinesic modalities is never truly complete in human utterances.

The Modality-Advantage Hypothesis

It has been claimed that little research exists to support the use of signed language with hearing infants,[14] yet there is a comparative wealth of information regarding the development of both gesture and signed language in Deaf and hearing infants. As opposed to signed language, "gesture" refers to forms that express meaning but lack syntax and other systematic linguistic structures. Gestural communication also has a more restricted range of functions than do spoken or signed words, which can be used to convey more complex references.[15] All young children produce both deictic, or nonsymbolic, gestures, such as pointing, and representational, or symbolic, gestures, such as clapping. Unlike deictic gestures, representational gestures are used fairly consistently by young children to express fairly consistent meanings.[16]

A more limited body of research exists to support baby-sign advocates' frequent claim that hearing infants using signed language can express themselves at an earlier age than with speech.[17] As an example of this claim, one baby-sign Web site states that infants can "make signs" at six months of age, whereas spoken language typically develops from twelve to eighteen months.[18] However, another group of researchers argues that "signed language" in the context of the studies cited by Richard Meier and Elissa Newport that found a modality advantage has been confused with prelinguistic gestural communication. This prelinguistic communication, involving both deictic and representational gesture, is also seen in infants not exposed to signed language.[19] This latter group of researchers argues that the gestural modality is advantaged in infants' earliest communications but that this advantage is prelinguistic.[20] In fact, Newport and Meier argue that, despite suggestions that earlier maturation of hand motor control and the visual cortex contributes to earlier production of first signed words or lexical items, "there is not a general advantage for visual-gestural, as compared with auditory-vocal, language."[21] It may be more accurate to state that there is a linguistic delay for spoken words due to peripheral difficulties in the auditory-vocal mode than to claim a linguistic advantage for signed words.[22] Although there continues to be debate regarding the linguistic or gestural nature of infants' first manual productions, these two groups of researchers concur regarding the identical timing of subsequent linguistic milestones in spoken and signed languages, including two-word utterances.

Both of these lines of argument may also correspond to research showing that symbolic gesturing confers a short-lived timing advantage for infants' expressive spoken language.[23] Linda Acredolo and Susan Goodwyn have significantly contributed to a long-running body of research that is frequently cited as evidence

for the use of baby sign; however, these authors have largely focused on the use of symbolic gesturing rather than ASL with hearing infants. An exception is the authors' revised Baby Signs program, which teaches ASL vocabulary in addition to providing "baby-friendly alternative signs and strategies."[24] The gestural modality may therefore be advantaged for nonlinguistic communication only.[25] Virginia Volterra, Jana Iverson, and Marianna Castrataro state that, "[i]nterestingly, there is surprisingly little variability in the age of onset of first manual symbols across groups of children with exposure to gestural input that ranges from asystematic (i.e., the spontaneous gestures accompanying parental speech to children with no sign training experience) to enhanced gestural input (i.e., sign training) to a fully fledged linguistic system (i.e., ASL)."[26] However, Laura-Ann Petitto argues that in deaf infants exposed to signed language from birth, manual babbling appears that is distinct from the communicative gestures made by all babies.[27] This hand babbling in signed language–exposed infants corresponds to vocal babbling in hearing babies in terms of phonetic and syllabic structure, manner of use, and stages of development.

Research that maintains that the timing of early linguistic milestones in signed and spoken languages is identical[28] is linked to underlying conceptions of language that refuse differentiation between modalities. Namely, if signed and spoken languages are argued to be biologically equal, then there is no inherent human preference for language in one modality. Adele Abrahamsen refers to the single-word period of development in young children (typically from age twelve months to nineteen months) as the "bimodal period," because during this time frame, gestures and spoken utterances share equipotentiality as vehicles for communication.[29] Following this period, children normally acquire the (signed or spoken) language of their parents. This point regarding all infants' bimodal communications also relates to Kendon's arguments regarding the bimodal nature and origins of human language in general.[30] Given the biological equality of spoken and signed languages, the question arises as to whether there are special advantages—a Deaf Gain—to hearing children's learning of signed language. As I will show in the remainder of this chapter, there are indeed both inherent and identified benefits to young hearing children's exposure to signed language. These benefits are in line with Paddy Ladd's definition of Deaf people's positive biology, from which signed languages emerged and which includes "enhanced visual skills; sensitivity to touch and enhanced general tactility; and enhanced use of face, hands, and bodies."[31]

Deaf Gain: Bimodal Bilingualism

Bimodal bilingualism is common in the Deaf community, whose members typically make use of two languages in the signed and written (and sometimes spoken) modalities. What potentialities are manifest in hearing children's acquisition of bimodal bilingualism involving a signed and a spoken language?

Metalinguistic Awareness

One of the most common findings of research studies regarding bilingual students is in relation to metalinguistic abilities, or heightened awareness of the structure and functions of language.[32] The ability to analyze language and the enhanced awareness of language structure (such as grammar rules) that results from this analysis are required for academic language use, including reading and writing,[33] and for the comprehension and production of cognitively demanding texts, including signed-language texts. Comparison studies of young bilingual and monolingual students show advantages in metalinguistic skills for bilingual children.[34]

In the case of bimodal bilingualism involving a signed language, hearing infants acquire the ability to master forms in two modalities.[35] Based on an earlier case study of a bilingual hearing child of Deaf parents, Volterra, Iverson, and Castrataro suggest that hearing infants who are exposed to both a signed and a spoken language display more extensive use of representational gestures than monolingual children exposed to only spoken language. Monolingual children more frequently produce deictic (instead of representational) gestures, whereas bimodal bilingual infants also have the ability to combine two representational gestures. This ability to combine gestures does not appear in children exposed only to spoken language. Additionally, bilingual bimodal children produce more cross-modal combinations that employ both spoken and signed utterances.[36] Unlike spoken-language bilinguals, bimodal bilinguals may simultaneously perceive and produce lexical items from two languages in different modalities.[37] An enhanced awareness of and ability to exploit the potentialities of language in either modality is one instance of the Deaf Gain conferred by hearing children's learning of signed language. Further research is needed in order to uncover the nature of distinct linguistic and cognitive processes that are activated by bimodal bilingualism in signed and spoken languages.[38]

Vocabulary Development

Awareness of language in spoken and signed modalities appears to foster children's enhanced vocabulary growth.[39] Bilingual bimodal children who have been proficient in ASL since preschool have been shown to score significantly higher than average on measures of English vocabulary.[40] Additionally, preschool and kindergarten classes receiving instruction in ASL vocabulary items scored significantly higher on tests measuring receptive English vocabulary than control groups that did not receive this ASL instruction.[41] These vocabulary gains in young children appear to be maintained over time without further interventions taking place.[42] It is significant that exposure to ASL enhances vocabulary in hearing children, because some studies of spoken-language bilinguals have shown lower vocabulary levels for bilingual children than monolingual children,[43] although other studies have not found significant differences.[44] This point regarding vocabulary differ-

ences between bimodal and unimodal (spoken language only) bilinguals may be linked to studies that highlight the greater processing demands faced by unimodal bilinguals. Because the same articulation system is used for unimodal bilinguals' two languages, spoken-language bilinguals face more difficult linguistic selection and control processes. Bimodal bilinguals, instead, enjoy the use of cross-modal distinctions between languages, although the vocabulary advantage conveyed by bimodal bilingualism may be explained by a lack of advantage in executive control.[45]

Enhanced Literacy

For all children, metalinguistic awareness and vocabulary growth are key factors in emergent literacy.[46] Additionally, young hearing children's learning of signed language has been linked to enhanced literacy levels. One study of first-grade students taught by a Deaf British Sign Language (BSL) tutor found statistically significant improvements in hearing students' reading, in addition to enhanced vocabulary, concept development, and math skills.[47] Although there have been attempts to similarly assess the impact of hearing children's learning of ASL on their English literacy, some methodological problems (including the absence from two studies of a teacher with a high level of proficiency in ASL) have restricted the scope of these studies.[48] Nonetheless, statistically significant positive differences were found for students learning a signed language on tests of letter and word identification.[49]

Some of the most robust data that link learning of signed language to reading skills has been conducted with Deaf students.[50] These data may not necessarily be applicable to hearing children, who can more readily access English in its spoken form, but more recent evidence regarding ASL's support for the bilingual, bimodal linguistic basis of reading may in theory be extended to hearing children. Namely, studies showing that proficiency in ASL syntax and narrative comprehension predicts reading skill[51] and studies suggesting that access to ASL phonology provides the requisite linguistic and cognitive underpinnings of written language development[52] may be combined with arguments regarding bilingual academic-language proficiency to advance a model of bilingual, bimodal education for hearing and Deaf children. This point will be dealt with more fully in the section on implications later in this chapter.

Deaf Gain: Cognition

Studies of spoken-language bilingual children have demonstrated a significant relationship between bilingualism and nonverbal cognitive or problem-solving abilities.[53] However, the nonverbal abilities tested in these studies related to perceptual reasoning or attentional control. In regard to attentional control, unlike individuals who are bilingual in two spoken languages, bimodal bilinguals have not performed better than monolinguals.[54] The authors of this latter study hypothesize

that less executive control is needed by bimodal bilinguals, who can simultaneously produce lexical items in signed and spoken languages.

Other studies have demonstrated a positive relationship between bilingualism and episodic (nonverbal) memory as well as semantic (verbal) memory.[55] However, working memory has been shown to be shorter for Deaf and hearing signers than for speakers; this difference is likely due to the use of the visual instead of the auditory system for processing in signers.[56] Bilingualism nonetheless appears to confer a general (linguistic and nonlinguistic) cognitive benefit.

Research that investigates the contributions made by hearing children's learning of signed language to nonlinguistic cognitive domains indicates distinct benefits in the visual-spatial domain. One group of Italian researchers conducted a longitudinal study that investigated the performance of hearing first- and second-grade students learning signed language on tests of visual-spatial skills and spatial memory. The students attended a weekly course in Italian Sign Language (LIS) that was taught by a Deaf teacher who used LIS as a first language. A control group was established of hearing students who were from the same neighborhood and economic background but who were not exposed to LIS. Students learning LIS showed significantly greater visual discrimination and recognition of spatial relations than students who were not learning LIS.[57]

An interesting aspect of this study is that its researchers conducted a follow-up experiment to determine whether these cognitive benefits were due to learning a second language in general or a signed language in particular. Students learning LIS were compared to a control group learning English. All students were from monolingual Italian-speaking families. Students attending the LIS course significantly outperformed the English learners on tests of visual perception and visual and spatial memory. These findings are in line with research reviewed by Karen Emmorey that found enhanced spatial memory in bimodal bilinguals.[58] As cited in Olga Capirci and colleagues, these results are also in line with a body of research showing enhanced visual-spatial abilities in Deaf children exposed to signed language.[59] Additionally, bimodal bilinguals show enhanced performance on other nonlinguistic cognitive tasks, including mental imagery and facial processing.[60] Learning signed language appears to confer a Deaf Gain in uniquely enhanced visual and spatial abilities that are not found in spoken-language bilinguals. As I mentioned earlier, further research is needed to more fully investigate cognition in bimodal bilingual individuals.

The next section explores the kinds of educational programs that might best facilitate hearing children's access to the benefits of signed language.

Implications: Reaping the Benefits of Signed Language for Hearing Children

Given the benefits of hearing children's learning of signed language that have been outlined here, we should ask whether current programs for teaching signed language to hearing children provide an optimal level of Deaf Gain. Consider-

ations raised by the cited studies warrant further inquiry into program design. A central issue is the relative benefit of teaching a native signed language versus teaching the enhanced gesturing that is employed by a number of baby-sign programs. Children who are exposed only to enhanced gesture may be less likely to reap either the general advantages of bilingualism in terms of enhanced metalinguistic awareness or the specific advantage of being able to use language in either the signed or the spoken modality. Although young children's use of gesture selectively predicts later vocabulary skill,[61] more comparison studies are needed regarding the benefits to hearing children that are provided by baby-sign programs versus programs teaching a full, structured signed language. Further evidence for the linguistic basis of the Deaf Gain of signed language comes from brain-imaging studies that report more activity in language-specialized brain regions when adult signers view signed language than when they view nonlinguistic gestures.[62]

A further issue for consideration relates to how languages are best taught. Even when baby sign or other educational programs utilize discrete elements of ASL or other native signed languages, particularly vocabulary items, these programs often fail to provide a full or correct model of signed language (upon which it is argued that cognitive and linguistic benefits are based). For example, a Deaf mother who participated in the author's dissertation study reported attending a popular baby-sign program with her Deaf son. The hearing instructor of this program taught her class to sign MEATBALL using separate ASL words for MEAT and BALL. The ASL sign for BALL used by the instructor in this program is a semantic connotation that refers to sports equipment. In English, however, *ball* is a metonymic word that refers to the shape of an item. As the Deaf mother commented, using the generic sign for BALL with her son instead of an F-classifier hand shape denoting a small, round item would result in confusion for her son, who would comprehend the former sign as referring to an enormous ball of meat.

This lack of a full model of language for hearing children is frequently due to the omission of qualified bilingual signed-language instructors. The studies of hearing children that provide some of the clearest indications of Deaf Gain featured Deaf adult teachers who used a signed language as a primary language.[63] As Marilyn Daniels writes, hearing students in the United States are often taught by hearing teachers who use simultaneous communication or signed English rather than ASL.[64] The child participants in one of Daniels's studies, who were taught by a hearing teacher using mainly simultaneous communication, failed to produce nonmanual markers,[65] which are key components of question formation, prosody, intonation, adverbs, and adjectives in ASL and many other signed languages.[66] Furthermore, unlike the first-grade students in Kathy Robinson's study, the children in Daniels's study did not produce any ASL syntax (rather, they produced mainly ASL phonology—the hand shape, location, and movement of signed words).

High levels of proficiency in signed language (or any language) are achieved when children are taught by qualified bilingual teachers in programs that provide

an adequate amount of instructional time in signed language and that promote use of signed language by both teacher and students. As Jim Cummins argues, there are threshold levels of proficiency in a language that students must attain in order to reap the linguistic and cognitive benefits of bilingualism.[67] Proficiency in signed language must therefore look beyond simply functional communication and encompass academic-language learning involving the comprehension and production of complex texts. It is clear that schools and programs for teaching hearing children signed language must make greater use of partnerships with the signed-language-using Deaf community in order to facilitate the provision of high-quality education that enables children to become bilingual and biliterate in a signed language. Such programs will also greatly benefit Deaf and hard-of-hearing children in creating truly inclusive educational environments where all students and teachers are skilled in the traits of Deaf people's positive biology.[68]

The following sections will describe two successful initiatives for promoting children's academic ASL learning.

The ASL Parent–Child Mother Goose Program

Established in Ontario, Canada, in 2003, the ASL Parent–Child Mother Goose Program teaches ASL rhymes and stories to Deaf and hearing parents of young children. The program promotes ASL literature for young children while supporting positive communication and parent–child bonding. Recent research has documented the program's efficacy for promoting receptive and expressive language (visual attention and response) in very young Deaf and hearing children, including awareness of ASL phonology through hand-shape rhymes.[69]

Developing ASL Identity Texts

As part of a larger, cross-Canada study known as the Multiliteracies Project, ASL storytellers were brought into select elementary-grade classrooms at the Ernest C. Drury School for the Deaf in Milton, Ontario.[70] The storytellers invited by teacher participants all used the classic Ontario ASL dialect that is native to former students of the Ontario School for the Deaf (OSD) in Belleville. Through their stories about name signs and life at OSD, the storytellers inspired the students' own production of ASL identity texts. These identity texts presented the students' unique experiences as Deaf children, demonstrated their facility with the ASL storytelling process—part of the ASL curriculum for first-language learners that is in place at the three provincial schools for Deaf students in Ontario—and promoted critical inquiry into social realities. Although the ASL identity-text project was specifically tailored for Deaf children at a bilingual, bicultural Deaf school, similar initiatives can be envisioned for promoting hearing children's academic-signed-language proficiency. Projects featuring Deaf adult storytellers and promoting the creation of bimodal bilingual texts can be incorporated in other programs for Deaf and hearing students.

Conclusion

Native signed languages and literatures of the Deaf community show promise for enhancing hearing children's language, literacy, and cognition. However, the Deaf Gain of signed language for hearing children may be most apparent when bilingual Deaf adult teachers play a central role in program design and implementation. I also argue that greater efforts must be made by professionals, educators, and governments to promote signed language as a primary language for Deaf children, for whom it plays a much more vital role in learning and development than for hearing children.[71] The continued existence of qualified signed-language teachers for hearing children may also depend on maintaining a critical mass of Deaf children who are able to acquire a native signed language from infancy onward. Ironically, providing well-designed signed-language programming for hearing children may also be an effective way to ensure that Deaf children receive greater access to language and inclusion in mainstream settings.

In 1939, the Canadian Deaf community activist David Peikoff wrote, "My eyes have been my ears—my fingers my voice, and the sign language the Alpha and Omega of my very existence."[72] Seventy-five years later, Peikoff's declaration holds true for affirming the biological equipotentiality of language modalities. It is no less true that the culture-specific knowledge and contributions of signed-language-using people depend on the viability of their languages. Promoting signed language as a net Deaf Gain for all children may yet ensure these languages' maintenance and growth for use by future generations.

Notes

Special thanks to Kathleen Peets for her comments on an earlier version of this chapter.

1. American Academy of Pediatrics, "These Hands Were Made for Talking" (August 7, 2013), HealthyChildren.org, http://www.healthychildren.org/English/ages-stages/baby/Pages/These-Hands-Were-Made-for-Talking.aspx.
2. Trish Crawford, "Baby Signs of the Times" (2010), Parent Central, http://www.parentcentral.ca/.
3. Joseph Garcia, *Sign with Your Baby: How to Communicate with Infants before They Can Speak* (Mukilteo, Wash.: Northlight, 2004).
4. Product description for *Sign with Your Baby Complete Learning Kit,* by Joseph Garcia, Amazon Canada, accessed March 18, 2014, http://www.amazon.ca/.
5. Bob Rumball Centre for the Deaf, "WeeHands," accessed March 18, 2014, http://www2.bobrumball.org/dat/files/263.pdf.
6. Étienne Bonnot de Condillac, *Grammaire* (Paris: Presses Universitaires de France, 1775).
7. Douglas C. Baynton, *Forbidden Signs: American Culture and the Campaign against Sign Language* (Chicago: University of Chicago Press, 1996).
8. Douglas C. Baynton, "The Curious Death of Sign Language Studies in the Nineteenth Century," in *The Study of Signed Languages: Essays in Honor of William C. Stokoe*, ed. David F. Armstrong, Michael A. Karchmer, and John V. Van Cleve (Washington, D.C.: Gallaudet University Press, 2002), 13–34.
9. Marilyn Daniels, "Happy Hands: The Effect of ASL on Hearing Children's Literacy," *Reading Research and Instruction* 44, no. 1 (2004): 86–101.

10. Ibid.
11. Baynton, "The Curious Death of Sign Language Studies in the Nineteenth Century."
12. David F. Armstrong and Sherman E. Wilcox, *The Gestural Origin of Language* (New York: Oxford University Press, 2007).
13. Adam Kendon, "'Gesture First' or 'Speech First' in Language Origins?," in *Deaf around the World: The Impact of Language*, ed. Gaurav Mathur and Donna Jo Napoli (Oxford: Oxford University Press, 2011), 251–69.
14. Gwyneth Doherty-Sneddon, "The Great Baby Signing Debate," *Psychologist* 21, no. 4 (2008): 300–303.
15. Adele Abrahamsen, "Explorations of Enhanced Gestural Input to Children in the Bimodal Period," in *The Signs of Language Revisited: An Anthology to Honor Ursula Bellugi and Edward Klima*, ed. Karen Emmorey and Harlan Lane (Hillsdale, N.J.: Erlbaum, 2001), 357–99.
16. Virginia Volterra, Jana M. Iverson, and Marianna Castrataro, "The Development of Gesture in Hearing and Deaf Children," in *Advances in the Sign Language Development of Deaf Children,* ed. Brenda Schick, Marc Marschark, and Patricia E. Spencer (Oxford: Oxford University Press, 2005), 46–70.
17. For a review of this literature, see Richard P. Meier and Elissa L. Newport, "Out of the Hands of Babes: On a Possible Sign Advantage in Language Acquisition," *Language* 66, no. 1 (1990): 1–23.
18. "Frequently Asked Questions," Babysigners, accessed February 5, 2014, http://www.babysigners.co.uk/i2.php?mid=2&sid=0&a=page.
19. Virginia Volterra and Jana M. Iverson, "When Do Modality Factors Affect the Course of Language Acquisition?," in *Language, Gesture, and Space*, ed. Karen Emmorey and Judy Reilly (Hillsdale, N.J.: Erlbaum, 1995), 371–90.
20. Ibid.
21. Elissa L. Newport and Richard P. Meier, "The Acquisition of American Sign Language," in *The Crosslinguistic Study of Language Acquisition,* ed. Dan Slobin (Hillsdale, N.J.: Erlbaum, 1985), 1:890.
22. Meier and Newport, "Out of the Hands of Babes."
23. Susan W. Goodwyn, Linda P. Acredolo, and Catherine A. Brown, "Impact of Symbolic Gesturing on Early Language Development," *Journal of Nonverbal Behavior* 24, no. 2 (2000): 81–103.
24. Linda Acredolo and Susan Goodwyn, *Baby Signs: How to Talk with Your Baby before Your Baby Can Talk,* 3rd ed. (New York: McGraw-Hill, 2009), xvii.
25. Volterra and Iverson, "When Do Modality Factors Affect the Course of Language Acquisition?"
26. Volterra, Iverson, and Castrataro, "The Development of Gesture in Hearing and Deaf Children," 65.
27. Laura-Ann Petitto, "On the Biological Foundations of Human Language," in Emmorey and Lane, *The Signs of Language Revisited,* 447–71.
28. Ibid.
29. Abrahamsen, "Explorations of Enhanced Gestural Input to Children in the Bimodal Period."
30. Kendon, "'Gesture First' or 'Speech First' in Language Origins?"
31. Paddy Ladd, "Cochlear Implantation, Colonialism, and Deaf Rights," in *Surgical Consent: Bioethics and Cochlear Implantation*, ed. Linda Komesaroff (Washington, D.C.: Gallaudet University Press, 2007), 2.
32. Jim Cummins, *Negotiating Identities: Education for Empowerment in a Diverse Society,* 2nd ed. (Los Angeles: California Association for Bilingual Education, 2001).
33. Ellen Bialystok, "Levels of Bilingualism and Levels of Linguistic Awareness," *Developmental Psychology* 24, no. 4 (1988): 560–67.
34. Ajit K. Mohanty, "Bilingualism and Cognitive Development of Kond Tribal Children: Stud-

ies on Metalinguistic Hypothesis," in "Environmental Toxicology and Social Ecology," special issue, *Pharmacopsychoecologia* 5, nos. 1–2 (1992): 57–66.

35. Volterra, Iverson, and Castrataro, "The Development of Gesture in Hearing and Deaf Children."
36. Ibid.
37. Karen Emmorey, Helsa B. Borinstein, et al., "Bimodal Bilingualism," *Bilingualism: Language and Cognition* 11, no. 1 (2008): 43–61.
38. See Karen Emmorey, Thomas Grabowski, et al., "The Neural Correlates of Spatial Language in English and American Sign Language: A PET Study with Hearing Bilinguals," *NeuroImage* 24 (2005): 832–40; and Karen Emmorey and Stephen McCullough, "The Bimodal Bilingual Brain: Effects of Sign Language Experience," *Brain and Language* 109, nos. 2–3 (2008): 124–32.
39. Abrahamsen, "Explorations of Enhanced Gestural Input to Children in the Bimodal Period"; Volterra, Iverson, and Castrataro, "The Development of Gesture in Hearing and Deaf Children."
40. Marilyn Daniels, "ASL as a Factor in Acquiring English," *Sign Language Studies* 78 (1993): 23–29.
41. Marilyn Daniels, "Words More Powerful Than Sound," *Sign Language Studies* 83 (1994): 155–66; Marilyn Daniels, "Bilingual, Bimodal Education for Hearing Kindergarten Students," *Sign Language Studies* 90 (1996): 25–37; Daniels, "Happy Hands."
42. Marilyn Daniels, "Seeing Language: The Effect Over Time of Sign Language on Vocabulary Development in Early Childhood Education," *Child Study Journal* 26, no. 3 (1996): 193–209.
43. See Sandra Ben-Zeev, "The Influence of Bilingualism on Cognitive Strategy and Cognitive Development," *Child Development* 48, no. 3 (1977): 1009–18; Bialystok, "Levels of Bilingualism and Levels of Linguistic Awareness."
44. Kathryn W. Bamford and Donald T. Mizokawa, "Additive-Bilingual (Immersion) Education: Cognitive and Language Development," *Language Learning* 41, no. 3 (1991): 413–29.
45. Karen Emmorey, Gigi Luk, et al., "The Source of Enhanced Cognitive Control in Bilinguals: Evidence from Bimodal Bilinguals," *Psychological Science* 19, no. 12 (2008): 1201–6.
46. Catherine Snow, M. Susan Burns, and Peg Griffin, *Preventing Reading Difficulties in Young Children* (Washington, D.C.: National Academy Press, 1998); Elizabeth Sulzby and William Teale, "Emergent Literacy," in *Handbook of Reading Research,* ed. P. David Pearson (New York: Longman, 1991), 2:727–57.
47. Marilyn Daniels, "Sign Language Advantage," *Sign Language Studies* 2, no. 1 (2001): 5–19; Kathy Robinson, *Sign in Education: The Teaching of Hearing Children British Sign Language in School* (Birmingham, UK: Teesside Tec Press, 1997).
48. See Daniels, "Sign Language Advantage"; Marilyn Daniels, "Using a Signed Language as a Second Language for Kindergarten Students," *Child Study Journal* 33, no. 1 (2003): 53–70; and Daniels, "Happy Hands."
49. Daniels, "Happy Hands."
50. See Robert Hoffmeister, "A Piece of the Puzzle: ASL and Reading Comprehension in Deaf Children," in *Language Acquisition by Eye*, ed. Charlene Chamberlain, Jill Morford, and Rachel Mayberry (Mahwah, N.J.: Erlbaum, 2000), 143–63; Carol Padden and Claire Ramsey, "American Sign Language and Reading Ability in Deaf Children," in Chamberlain, Morford, and Mayberry, *Language Acquisition by Eye*, 165–89; and Michael Strong and Philip Prinz, "A Study of the Relationship between American Sign Language and English Literacy," *Journal of Deaf Studies and Deaf Education* 2, no. 1 (1997): 37–46.
51. Charlene Chamberlain and Rachel Mayberry, "American Sign Language Syntactic and Narrative Comprehension in Skilled and Less Skilled Readers: Bilingual and Bimodal Evidence for the Linguistic Basis of Reading," *Applied Psycholinguistics* 29, no. 3 (2008): 367–88.

52. Lynn McQuarrie and Rauno Parrila, "Phonological Representations in Deaf Children: Rethinking the 'Functional Equivalence' Hypothesis," *Journal of Deaf Studies and Deaf Education* 14, no. 2 (2008): 137–54.
53. Bamford and Mizokawa, "Additive-Bilingual (Immersion) Education"; Ellen Bialystok, "Cognitive Complexity and Attentional Control in the Bilingual Mind," *Child Development* 70, no. 3 (1999): 636–44.
54. Emmorey, Luk, et al., "The Source of Enhanced Cognitive Control in Bilinguals."
55. Reza Kormi-Nouri, Sadegheh Moniri, and Lars-Göran Nilsson, "Episodic and Semantic Memory in Bilingual and Monolingual Children," *Scandinavian Journal of Psychology* 44 (2003): 47–54.
56. Karen Emmorey and Margaret Wilson, "The Puzzle of Working Memory for Sign Language," *Trends in Cognitive Sciences* 8, no. 12 (2004): 521–23.
57. O. Capirci et al., "Teaching Sign Language to Hearing Children as a Possible Factor in Cognitive Enhancement," *Journal of Deaf Studies and Deaf Education* 3, no. 2 (1998): 135–42.
58. Karen Emmorey, *Language, Cognition, and the Brain: Insights from Sign Language Research* (Mahwah, N.J.: Erlbaum, 2002).
59. U. Bellugi et al., "Enhancement of Spatial Cognition in Hearing and Deaf Children," in *From Gesture to Language in Hearing and Deaf Children*, ed. Virginia Volterra and Carol Erting (Berlin: Springer-Verlag, 1990); Abraham Zweibel, "More on the Effects of Early Manual Communication on the Cognitive Development of Deaf Children," *American Annals of the Deaf* 132 (1987): 16–20.
60. Emmorey, *Language, Cognition, and the Brain*.
61. Meredith L. Rowe and Susan Goldin-Meadow, "Early Gesture Selectively Predicts Later Language Learning," *Developmental Science* 12, no. 1 (2009): 182–87.
62. Mairéad MacSweeney et al., "Dissociating Linguistic and Non-linguistic Gestural Communication in the Brain," *NeuroImage* 22, no. 4 (2004): 1605–18, cited in Poorna Kushalnagar et al., "Infants and Children with Hearing Loss Need Early Language Access," *Journal of Clinical Ethics* 21, no. 2 (2010): 143–54.
63. See, for example, Capirci et al., "Teaching Sign Language to Hearing Children as a Possible Factor in Cognitive Enhancement"; Robinson, *Sign in Education*.
64. Daniels, "Sign Language Advantage."
65. Daniels, "Happy Hands."
66. Wendy Sandler and Diane Lillo-Martin, *Sign Language and Linguistic Universals* (Cambridge: Cambridge University Press, 2006).
67. Cummins, *Negotiating Identities*.
68. Linda R. Komesaroff and Margaret A. McLean, "Being There Is Not Enough: Inclusion Is Both Deaf and Hearing," *Deafness and Education International* 8, no. 2 (2006): 88–100.
69. Kristin Snoddon, *American Sign Language and Early Literacy: A Model Parent–Child Program* (Washington, D.C.: Gallaudet University Press, 2012).
70. Kristin Snoddon, "Technology as a Learning Tool for ASL Literacy," *Sign Language Studies* 10, no. 2 (2010): 197–213.
71. Kristin Snoddon, "American Sign Language and Early Intervention," *Canadian Modern Language Review* 64, no. 4 (2008): 581–604.
72. David Peikoff, cited in Clifton F. Carbin, *Deaf Heritage in Canada: A Distinct, Diverse, and Enduring Culture* (Toronto: McGraw-Hill Ryerson, 1996), 190.

10

MANUAL SIGNS AND GESTURES OF THE INUIT OF BAFFIN ISLAND

Observations during the Three Voyages Led by Martin Frobisher

CLARA SHERLEY-APPEL AND JOHN D. BONVILLIAN

The sixteenth century was a period of significant exploration and global expansion by European powers. Following Christopher Columbus's "discovery" of the New World, explorers from Spain, Portugal, France, Italy, the Netherlands, and England added much to what Europeans knew about the world's geography. Early expeditions by the English put them in contact with the Atlantic coast of North America. These expeditions failed to result either in the establishment of permanent colonies or in the development of profitable trade with the native inhabitants. In the latter half of the sixteenth century, the lure of a British-controlled trade route to Asia helped propel several British explorers to probe the northernmost reaches of the world. In this chapter, we focus on three voyages led by the English sea captain and adventurer Martin Frobisher (1535?–1594). In the course of these voyages, Frobisher and his crew encountered the Inuit people of what is now known as Baffin Island.[1]

European explorers and the indigenous Americans they encountered in early expeditions faced a major communication barrier: neither party could speak the other's language. Historical records from periods of first contact indicate that Europeans and Native Americans sometimes circumvented that barrier by using manual signs and gestures in lieu of a shared spoken language.

Much of the pioneering research on the signed languages used by the indigenous peoples of North America was conducted by Garrick Mallery (1831–1894). According to various reports, the use of signs by Native Americans extended at least from the Gulf of Mexico in the south to the Hudson Bay in the north.[2] The primary reason for this widespread use of signs, Mallery contended, was that they could overcome intertribal spoken-language communication barriers. With hundreds of different languages spoken by members of different American Indian nations,[3] Mallery argued that the emergence of some form of intertribal lingua franca was critical, and that that need was met by the use of signed languages.[4]

The historic importance of North American Indian Sign Language as a means to facilitate communication among persons who spoke many different languages has continued to be stressed by contemporary investigators.[5]

Although Mallery found highly convincing evidence for the use of manual and visual signs by many Native Americans, he acknowledged that accounts of sign-communication systems used by Inuit populations of the Far North were weaker. One reason for this uncertainty was that the Inuit tongue was seen as relatively homogeneous across the Arctic region and Alaskan Peninsula,[6] at least in comparison with the wide diversity of languages and language families across the rest of North America.[7] Mallery interpreted this apparent linguistic homogeneity and the sparseness of Inuit populations in the region to signify little need for the Inuit to develop and utilize signs to overcome communication barriers. Another reason for Mallery to doubt that the Inuit signed was that "the report from missionaries, army officers, and travelers in Alaska was unanimous against the existence of a sign language there."[8] Yet Mallery was not convinced of the accuracy of these reports and continued to view the question of whether or not the Inuit signed as unresolved.

Three hundred years earlier, English explorers were less equivocal about the existence of Inuit signs. When Martin Frobisher and his crew encountered the Inuit of Baffin Island for the first time, in the summer of 1576, the language gulf between the two groups was immediately apparent. English bears little resemblance to any Inuit spoken language. Nevertheless, members of Frobisher's crew describe meaningful encounters with the Inuit people, who made effective use of manual signs and gestures in their communicative interactions with the English. Based on descriptions by Frobisher and his crew, it is clear that the English explorers also relied heavily on manual gestures and signs in these interactions.

If there was little need for signs to overcome spoken-language communication barriers on Baffin Island, then why did the Inuit people Frobisher encountered appear relatively adept at signing? Evidently, factors other than linguistic diversity might be involved in the inception of new sign systems. One possibility we will examine in this chapter is that signs played a meaningful role in Inuit life through their frequent use in hunting. If maintaining silence was essential to the success of a hunt, then being able to communicate effectively through manual signs and gestures would likely be a critical aspect of a successful hunting expedition. A second possible explanation for the Inuit's use of signs that we examine is that the Inuit likely had a relatively high incidence of hearing impairment. If a distinct portion of the population suffered hearing losses during their lives, then these hearing-impaired persons and the people with whom they interacted might have embraced manual communication in their day-to-day lives.

Much of the chapter consists of an examination of the evidence for the use of manual signs by the Inuit people of Baffin Island during their communicative interactions with Martin Frobisher and his crew members during their three

expeditions to the island in 1576, 1577, and 1578. The primary evidence for the occurrence of signing by the Inuit comes from the records and reports kept by Frobisher's officers and sailors. This evidence is important for our knowledge about manual-sign use in North America in that it establishes, first, that signing was used in the far northern regions of the continent at the time of European exploration; and second, that manual signing could take place in a region with a sparse population and a relatively homogeneous tongue. Frobisher's voyages also are important historically in that they helped set the stage for subsequent English settlement of North America. We begin our account of the Frobisher voyages by providing the historical framework for these expeditions.

The Northwest Passage

The objective of Frobisher's 1576 voyage was to discover a northwest passage to the Pacific Ocean and the Orient. If such a passage were discovered, it would provide England with a trade route to China (or, as it was then known, Cathay) that was much shorter in distance than the existing routes around the Cape of Good Hope (Africa) or Cape Horn (South America).[9] Because Cathay was reported to be much wealthier than any of the royal courts of Europe at that time, and to be full of valuable merchandise,[10] if England could find a northwest passage, then English merchants stood to benefit most handsomely from any resulting trade.

Even in the 1570s, the idea of a trade route to Cathay through the Arctic was hardly new. In 1497, John (Giovanni) Cabot, sailing for England, believed he had found a northwest passage.[11] Some years later, his son Sebastian claimed that "he himself had entered the eastern entrance of the passage as early as 1507–09."[12] In 1565, Humphrey Gilbert became the first Englishman of the Elizabethan era to seriously propose a search for a northwest trade route.[13] Robert Ruby summarizes Gilbert's treatise: "England would have its own trade route to Cathay; profitable trade of some kind could be conducted along the route with the natives of America; and expeditions could establish a colony or a resupply station somewhere on the American coast."[14] No previous tract on Arctic exploration had made any mention of contact with Native Americans. The Northwest Passage, if it existed, had been meant to facilitate trade with Cathay, not to create trade relations with an unknown native population or to establish a colony. Though Gilbert framed his proposal as a business proposition,[15] it also contained hints of the westward expansion that would eventually become the British Empire. Though Elizabeth I sought to increase profits for her nation, the establishment of a possible British colony in America was a novel proposal—one that England's famously frugal monarch was not yet ready to embrace.[16]

Despite her frugality, Elizabeth I was not opposed to the idea of searching for a northern route to Cathay. She counted among her advisers Dr. John Dee (1527–1608), a noted "alchemist, mathematician, astrologer, [and] a polymath of numbers and of the occult."[17] Dee was also deeply involved in the study of navigation

and exploration. He expressed clear interest in a northern route to Cathay and had supported Sebastian Cabot's recommendations to search for a route prior to Elizabeth's reign. Dee, moreover, believed in the existence of the Northwest Passage; this belief was supported by other scholars and mapmakers as well.

Martin Frobisher, Privateer and Prospector

Before taking up the torch of Northwest Passage exploration, Martin Frobisher spent two decades as a privateer, a sailor licensed by the Crown to attack and loot enemy trade ships. Elizabeth I tolerated—even encouraged—privateering. Because England's allies were often richer than its foes, Frobisher had a habit of selectively ignoring instructions from the Crown when hefty bounties were at stake.[18] Often acting more like a pirate than a privateer, Frobisher was imprisoned when found in possession of valuables taken from the ships of English merchants and their allies.[19] Yet the future explorer had friends in high places, and he was released shortly after his incarceration.

Frobisher's scrappy nature led historian Samuel Eliot Morison to write, "For seamanship, courage, and experience, no man could have been better qualified than Frobisher for the voyages he now undertook."[20] Though sixteenth-century scholars were optimistic about the presence of a northwest passage, most had reservations about its ease of navigation. Richard Grenville (who happened to be Humphrey Gilbert's cousin) expressed his concerns about sailing to the Northwest: "[C]onsideringe the seas and ayre vnder the Artike circle are so congeled that they are navigable only 3 monethes in the yeare, whereof it is requisite to reserve at least one monethe to retorne, if the said passage sholde not be mette withall."[21] Frobisher, known for his ability to escape dangerous situations, was well suited to leadership in the harsh Arctic environment.

Frobisher's resourcefulness is also reflected in the circumstances surrounding his supplanting of Gilbert as the chief architect of the Northwest Passage project. A decade after Gilbert's proposal, Frobisher managed to convince his supporters that the idea of the Northwest Passage was his alone.[22] This was important, as the discovery of a northwest passage would make whoever found it extraordinarily wealthy. By establishing himself as the sole proprietor of the Northwest Passage concept, Frobisher was securing the profits associated with it for himself and his associates. After reviewing Frobisher's petition to search for a northwestern route to Cathay, members of the queen's Privy Council approved his request. Shortly afterward, Frobisher and his business partner, Michael Lok, formed a company to explore the Northwest Passage.

George Best (or Beste), who authored accounts of all three voyages to Baffin Island in the years following the first expedition, was particularly helpful in establishing the myth of Frobisher's genius.[23] In his 1578 pamphlet *A True Discourse of the Late Voyages of Discoverie, for the Finding of a Passage to Cathaya, by the Northweast, under the Conduct of Martin Frobisher Generall*,[24] he insisted that "Frobisher

labored fifteen years organizing the expeditions."[25] Such claims were pure invention, but Best was a zealous and persuasive man. He was convinced of Frobisher's greatness and compared him to the greats of classical thought.[26] Though his affection for Frobisher was perhaps misguided, his enthusiasm for the man and the project was genuine and infectious.

Before the first voyage commenced, the learned John Dee would also assist Frobisher. Dee tutored Frobisher and two men under his command, Christopher Hall and Owen Griffen (or Gryffen), to enhance their navigational skills in light of concerns about sailing in the Arctic.[27] Dee evidently did not limit his advice to geography and navigation but included opinions on political issues as well.[28] These included advice on how to establish relations and how to successfully interact with native inhabitants whom the explorers might encounter.[29]

The First Voyage

After Lok had obtained two barks (a type of sailing vessel common in the sixteenth century), the *Gabriel* and the *Michael,* and Frobisher had assembled his crew, the expedition was ready to be launched.[30] Christopher Hall, master of the *Gabriel,* kept a log of the first voyage, beginning with its inauspicious start. The *Michael, Gabriel,* and a pinnace set sail on June 7, 1576, but they did not get very far.[31] As Hall notes, "[O]ur Pinnesse burst her boultsprit, and foremast aboard of a ship that rode at Detford."[32] After making the necessary repairs, the vessels sailed past Queen Elizabeth at court in Greenwich the next day, and she waved them on their way.

The journey to Baffin Island continued much as it began. As they approached Greenland, the *Michael*, *Gabriel,* and pinnace were rocked by a weeklong storm.[33] When the storm cleared, the crew came in sight of Greenland's shores. Though "the Captaine with 4. men rowed to the shoare to get on land," the fog and ice prevented them from reaching their goal.[34] This was the crew's first taste of the difficulties presented by the harsh Arctic climate.

After the occupants of the *Gabriel*'s boat returned from their unproductive excursion, the three ships continued their journey toward the Arctic Circle. Two days later, another storm struck, this one with enough force to separate the ships. The *Michael* lost sight of the other vessels, and its master, Owen Griffin, turned back to England shortly thereafter. Hall perhaps wished he had done the same. In his log, he wrote, "[T]he vehemencie of the winde brake our foryarde, and bore over boord our myssen maste."[35] The *Gabriel*'s damage was nothing compared with that of the pinnace. At seven tons, the pinnace was much smaller than the two barks with which it made sail. Its diminutive size and limited crew were unable to handle the high seas and the storm; the pinnace sank, taking four men with it.[36]

With the loss of the pinnace and the defection of the *Michael*, the *Gabriel* was alone by the time the storm ended. On the twenty-sixth of July, the crew sighted "a land of yce."[37] Hall's record of this initial sighting is sparse: he notes the latitude,

sixty-two degrees and two minutes (62°2'), but little more. Two days later, as the *Gabriel* edged closer to shore, Hall hazarded a guess as to their location. On "the clearing up of the fogge," he wrote, "we had sight of lande, which I supposed to be Labradore, with great store of yce about the land."[38] It was a reasonable guess that nevertheless was wrong. In fact, the *Gabriel* had stumbled upon Baffin Island.[39]

Navigating the *Gabriel* in the waters surrounding Baffin Island proved very difficult, with the ice floes there proving no less cumbersome than those off the coast of Greenland. More than a week passed before any of the crew successfully set foot on this new land. On the tenth of August, Hall took four men in the *Gabriel*'s rowboat to "an Island one league from the maine," which he named Hall's Island for himself.[40] The four sailors who came ashore with Hall wanted their own piece of this new discovery; they took objects from the island to prove that they had reached land. Though most of these objects were quickly forgotten, one would gain significance when the *Gabriel* returned to England. One sailor, Robert Garrard, took with him a large black rock that he found on the shore and gave it to his captain.[41] Though Frobisher was unaware of its significance at the time, in taking Garrard's stone he was paving the way for his next two voyages.

Hall's foray was a landmark achievement. The crew now knew that the ice would not stop them from navigating to shore. Over the next eight days, they sailed along the coast, naming places as they went. On the nineteenth of August, Frobisher, Hall, and eight men set out to explore one such island. A short way toward shore, "we had sight of seven boates, which came rowing from the East side, toward that Island."[42] This was the crew's first encounter with the region's native inhabitants, the Inuit. Surprised, the Englishmen started to head back to the *Gabriel* to rethink their plan, but after a short time chose to return to where they had encountered the Inuit. As Hall and the other crewmen approached the Inuit, Hall "gave each man and woman a button hook, the instrument a properly dressed Englishman used for lacing his clothes [and] through sign language, he agreed to allow one of the Inuit to visit the *Gabriel*."[43] James McDermott provides a similar narrative of this encounter. This time, however, it is "one of them [the Inuit]" who expresses his desire to board the *Gabriel* by "making signs to Hall."[44] In this initial encounter, both parties relied on manual signs in their communicative interaction. It had rapidly become clear that spoken language would not serve as an effective means of communication, for as Hall later observed, "[T]hey spake, but we understoode them not."[45]

Hall was certainly not the first European to encounter signed communication by Native Americans.[46] It is nevertheless noteworthy that *both* Europeans and Inuit appeared comfortable with the notion of manual and gestural communication in these early encounters. Though the historical record does not provide us with details as to what signs the crew of the *Gabriel* used, Morison reports that before relations went sour, "[o]ne Eskimo [Inuit] who came on board was engaged, by sign language, to pilot *Gabriel* through the supposed Strait by paddling ahead in

his kayak."[47] How Frobisher and his crew managed to communicate the notion of an Arctic strait large enough to allow passage for the *Gabriel* to their Inuit "friend" by means of a limited number of probably fairly transparent signs is not clear. In all likelihood, understanding between the Inuit and Europeans was not as complete as the crew of the *Gabriel* believed.

The initial interaction between the Englishmen and the Inuit had gone well. After the crew of the *Gabriel* presented the Inuit with trinkets and convinced them to come aboard for food and drink, the Inuit returned to shore. The next day was more problematic. As Frobisher and Hall went to shore with four members of their crew, they came upon several boats of Inuit. After a brief return to the *Gabriel* to regroup, they began by instigating trade. Frobisher's ultimate intentions were far less innocuous: he sought a human captive as a trophy of his achievement as an explorer.

Hall sheds some light on the details in his log. He writes, "[O]ne of their company came into our boate, and we carried him a boord and gave him a Bell and a knife: so the Captaine and I willed five of our men to set him a shoare at a rocke and not the company, which they came from." After preliminary contact and exchange of goods, Frobisher and Hall sent five men to entice an Inuit forward, intending to separate him from the larger group. The Inuit were not as guileless as Frobisher anticipated, however, and instead of playing into the hands of his men, "their wilfulnesse was such, that they [Frobisher's men] would goe to them, and so were taken themselves, and our boate lost."[48] Frobisher's plan had backfired: not only had he failed to kidnap an Inuit but he had lost valuable members of his crew in the process.

With ice blocking passage through the supposed Arctic strait, five of his men missing, the pinnace lost, and the *Michael* presumed so as well, Frobisher must have been quite discouraged. On August 21, the *Gabriel* went looking for the missing crew members. The men "shotte off a fauconet, and sounded [their] trumpet," hoping to alert the missing men to the presence of their ship in case they were out of visual range. Unfortunately, the endeavor was fruitless, and, receiving no reply, the *Gabriel* anchored for the evening away from the mainland. The next morning, the sailors on the *Gabriel* "had sight of foureteene [Inuit] boates, and some came near to us, but wee could learne nothing of our men."[49] Though their captors prevented the five crewmen from returning to the *Gabriel* in the immediate aftermath of their skirmish with the Europeans, this new group of Inuit were either lying or knew nothing of the crewmen's fate.

With the odds of finding their missing men getting slimmer every day, Frobisher and Hall concocted a plan. If they could not secure the safe return of the five men they had lost, they would at least finish the plot their crew members had set in motion. The *Gabriel* returned one final time to shore. As anticipated, they came upon several of the sealskin boats they knew so well. Frobisher's crew employed trade, their source of positive interactions with the region's indigenous

inhabitants, to "[intise] one boate to our ships side, with a Bell, and in giving him the Bell, we tooke him, and his boate, and so kept him."[50] Before the *Gabriel* departed, Frobisher made a final attempt to discern the whereabouts of his men. After hoisting the Inuit man onto the *Gabriel*, Frobisher promised "in sign language and probably more shouts . . . to free his new captive in exchange for the five missing sailors."[51] The Inuit claimed they knew nothing and, after a short period of fighting, departed. With no Northwest Passage to Cathay traversed, little hope of finding the lost crew members, and summer quickly coming to an end, there was nothing left for the *Gabriel* to do. After four days of recuperation and one more futile search, the ship turned back toward England on August 26.[52] A month and a half later, the sailors were home.

Homecoming

The *Gabriel* arrived in London on October 9, 1576, four months after its departure. As it happened, Frobisher's return was a wonderful surprise; when the *Michael* doubled back to England after the storm off the coast of Greenland, its master, Owen Griffin, reported the *Gabriel* lost. Despite Frobisher's seeming failures, he had maintained the *Gabriel* afloat and kept most of his crew alive. More to the point, perhaps, the loss of a small vessel like the pinnace in a wretched storm was hardly uncommon, and the loss of a few sailors on a four-month voyage hardly unexpected. As everyone had presumed Frobisher and his crew dead, the very fact of their reappearance was enough to ensure that they returned as heroes.[53]

The major disappointment of the mission was its failure to achieve its original goal: to discover and claim a northwest trade route to Cathay. But no one outside the *Gabriel* knew just how far they had progressed, and Frobisher did not volunteer that information. Indeed, Frobisher and the crew of the *Gabriel* apparently were convinced that the very large bay into which they had sailed and named Frobisher Strait was the dreamed-of Northwest Passage. With no evidence to the contrary, "courtiers believed that Martin Frobisher had found a passage to Cathay, indeed did not dare doubt him, because Her Majesty Queen Elizabeth believed him."[54] Moreover, Frobisher had returned with "evidence" of their discovery in the form of a human captive. As Hall noted in his personal logs, the Inuit they encountered "bee like to Tartars, with long blacke haire, broad faces, and flatte noses, and tawnie in colour."[55] Englishmen were familiar with only one group of foreigners who fit that description: the very "Tartars" to whom Hall had referred.[56] With Frobisher claiming success, the journey's investors (including Frobisher's business partner, Michael Lok) assumed he spoke the truth and took the "marvelously unusual stranger [to be] living proof that the *Gabriel* had reached Cathay."[57]

The biggest surprise associated with Frobisher's return was not the presence of a strange Inuit man, nor even the survival of both the *Gabriel* and the *Michael*. Rather, it was the black stone that one of Frobisher's men had taken from the island he had explored with Christopher Hall. Lok took great interest in the stone

immediately, and though he did not tell Frobisher about his intentions, he took it to assayers to have it appraised for gold content.[58] Three separate assayers failed to find gold in Frobisher's rock, but Lok pressed on. Perhaps because of the acclaimed stature of Frobisher's voyage, or perhaps because he sought a commission from the queen, Lok's fourth evaluator, Giovanni Battista Agnello, quite literally cooked the data.[59] Agnello probably was more interested in future earnings than the truth, so he told Lok what he wanted to hear: the rock contained substantial amounts of gold. Lok took care of the rest, persuading his investors that their interests were best served by sponsoring a second voyage rather than by forcing him to pay them their shareholders' dividends, which Lok did not have.[60] Within seven months of Frobisher's return, Lok turned his black stone into financing for a second Arctic journey.

The Second Voyage

On May 26, 1577, Frobisher set out on his second voyage. This time, he had far more resources. In addition to substantial monetary contributions from Lok's investors, the queen lent her ship, the *Ayde,* to Frobisher to serve as his flagship.[61] Accompanying the *Ayde* were four much smaller vessels: the two barks, *Michael* and *Gabriel*, and two new pinnaces. The trip to Meta Incognita, as the region was now being called, was much easier this time around. By July 19, the crews had "made us a large entrance into the streights [through Frobisher Bay], so that without any impediment . . . they entred them."[62] Frobisher took several men to the shores of Hall's Island in one of the smaller boats. They wandered around for a few hours, scouring the island, and saw several Inuit climb Mount Warwick—named for the Earl and Countess of Warwick, who were enthusiastic supporters of Frobisher's expeditions.[63]

This initial encounter with the Inuit, at the very outset of the second voyage's first land excursion, would set the tenor of the rest of the trip. Whereas interactions between the English and the Inuit had been relatively limited during the first voyage, the two groups saw each other almost daily for the entirety of Frobisher's second stay in the region. Regularity of contact, combined with Frobisher's desire to obtain information about the men he had left (in what subsequently became known as Frobisher Bay) nearly a year before, led to increased communication during the second voyage.

Dionyse Settle, a soldier on the *Ayde,* recorded five instances of manual-gesture interaction over the course of the second voyage; these interactions appear to have been fairly complex. In early August, Frobisher and a group of men came ashore on an island in Countess of Warwick Sound. Here, encountering several Inuit, "our Generall desirous to have some newes of his men, whom he lost the yeere before, with some company with him repaired with the ship boat to common, or signe with them for familiaritie, whereunto he is perswaded to bring them." Once again, we see that manual signs and gestures constituted the communicative

approach of choice. Further, the Inuit and Europeans in this case appear to have understood one another fairly well. The island's native inhabitants "at the first shew made tokens, that three of his five men were alive, and desired penne, ynck, and paper, and that within three or foure dayes they would returne, and (as we judged) bring those of our men which were living, with them."[64]

Evidently, the English explorers and the Inuit they encountered were able to discuss important matters meaningfully enough through signs and gestures. As the conversation wore on, the Inuit "also made signes or tokens of their King, whom they called Cacough, & how he was carried on mens shoulders, and a man farre surmounting any of our company, in bignesse and stature."[65] This passage is revealing, because it illustrates that manual communication and speech accompanied one another at least some of the time: as the indigenous islanders made "signes or tokens," they also spoke the name of their leader.

As the Inuit had indicated that they would return with Frobisher's men within four days of their meeting, the crew retired to their ships for the intermediary period. When the Europeans subsequently returned to the spot where they had agreed to meet, they could not find the Inuit. Frobisher then took some of the crew in a boat with him to find the Inuit, and when he did, "they seemed very glad, and allured him about a certaine point of the land: behind which they might perceive a company of the crafty villaines to lye lurking, whom our Generall would not deale withal, for that he knew what company they were, and so with few signes dismissed them and returned to his company."[66] In the same breath, Settle writes, "[O]nce again our generall, for that he hoped to hear of his men, went towards them [the Inuit]: . . . perceiving we made no hast by words nor friendly signes."[67] Again, we see evidence of multiple modes of communication. Frobisher, however, could not get any real information on his missing men; in all likelihood, they had died from exposure during the harsh Arctic winter.

The English were more successful in obtaining substantial amounts of the black rock that had generated such excitement after the first voyage. Frobisher, under orders from his queen, also wished to obtain additional Inuit captives. The Englishmen's Inuit captive from the first voyage had died shortly after reaching England, and Elizabeth wanted more opportunities to parade around her countrymen's "discovery." She instructed Frobisher to bring several Inuit home with him, and he attempted to do so. During a conversation with the Inuit, the English overpowered one Inuit man and brought him aboard ship.[68] When the English subsequently landed a small party shortly thereafter on the shore west of Jackman Sound, they encountered a number of Inuit. In the ensuing skirmish, at least a half dozen Inuit were wounded. In their haste to flee from the "well-armed Englishmen," the Inuit left behind a woman and a young child.[69]

Now with three captives, the English learned substantially more about the Inuit and their culture than they had during the previous trip. Inuit food sources were primarily animal, consisting of deer, marine creatures, rabbits, wolves, bears, and

"sea foule of sundrye sorts."[70] Though Frobisher and his men encountered only one particular Inuit cultural group on Baffin Island, evidence from Settle's pamphlet suggests that multiple cultural or linguistic groups engaged in trade with one another. The Englishmen's conversations with the Inuit revealed that "they have conversation with some other people, of whom for exchange they should receive the same."[71] Finally, despite the practical nature of most of their clothing (including thick furs), Inuit mythology implied ancestors from a far more temperate environment. Frobisher Bay's inhabitants "ma[d]e signes of certaine people that weare bright plates of gold in their foreheads, and other places of their bodies."[72] Again, the elaborate details of this story were conveyed through manual signs.

Although Settle fails to identify his sources, it is probably a safe assumption that the English extracted these accounts from the Inuit they had captured. Those Inuit who remained on Baffin Island now severely distrusted the English. At the end of August, the *Ayde*, *Michael*, and *Gabriel* turned back toward England with the black stones they had extracted and their three captives. The three captives died shortly after their arrival in England.

The Third Voyage

Frobisher and Lok convinced their investors to finance a third voyage in 1578. This occurred despite the fact that new assayers raised significant doubts about Agnello's evaluation of the content of the original black stone; the new assayers found a decreasing proportion of gold in each new assay. But, rather than being scaled back, the scope of the enterprise was considerably expanded, as the Crown evidently still expected a substantial net return from the ore extracted from Baffin Island. For the third voyage, Frobisher officially had command of a fleet of ten vessels, with several other vessels sailing with the fleet unofficially.[73]

An important reason behind the much-increased size of the enterprise was that the queen and her council, still enthusiastic about the potential wealth to be extracted from Baffin Island, had decided to establish a colony there. This decision to establish a colony in the New World meant that the most radical of Humphrey Gilbert's proposals from 1565, colonization, had finally won acceptance. To set up such a colony required that Frobisher's fleet be expanded to transport those men who would live there year-round, the foodstuffs they would need until they could be resupplied the following year, the equipment they would use for their mining operation, and the building supplies needed to construct dwellings on a barren landscape.

As the English fleet sailed along the western coast of Greenland prior to their arrival at Baffin Island, they spotted an area largely devoid of ice and with evidence of human habitation onshore. Frobisher, accompanied by some of his crew, elected to go ashore. According to the 1578 account by Thomas Ellis, sailor, the English found a number of tents made of animal skins and Inuit watercraft. Inside the tents, they found fish, animal flesh and skins, and various other items. Of

particular interest was a box of nails. From this discovery, the English "did coniecture, that they [the Inuit] had either Artificers [skilled craftsmen] amongst them, or else a trafficke with some other nation."[74] Because the Inuit had fled upon the Englishmen's approach, Frobisher was unable to establish communication with them. Probably hoping to foster better communication in the future, Frobisher ordered his men not to destroy or pillage the Inuit encampment. Wrote Ellis, "Our Generall (because he would have them no more to flee, but rather encouraged to stay through his courteous dealing) gave commandement, that his men should take nothing away with them, saving onely a couple of white Dogges, for which he left pinnes, pointes, knives, and other thinges, and departed, without taking or hurting any thing."[75]

As Frobisher's fleet approached their intended landing area on Baffin Island, the vessels were caught in a violent storm. One of the vessels, the *Denys,* collided with an iceberg and rapidly sank. Fortunately, all of its occupants were rescued. But the loss of this ship, together with the preventive measures taken by the remaining vessels, resulted in many of the planned colony's building supplies and victuals' being lost even before construction of the colony had commenced.[76] This event meant that the plans for colonization had largely evaporated by the time Frobisher went ashore on Baffin Island in the summer of 1578. Moreover, the assays performed by Jonas Schutz, the metallurgist appointed by Lok's investors to accompany Frobisher's crew on their third and final voyage, found little value in the black stones that the men had been sent to mine.[77] Though they carried back hundreds of tons of the ore, upon final inspection this ore proved worthless. It turned out that the original three assayers were correct in their assessments that the black stone that Frobisher had carried back from the first voyage was just a rock. This rock is known as hornblende, with the mica in it accounting for its sparkle.[78]

In the third voyage, George Best served as the captain of the *Anne Frances*. In his account of this voyage, Best included comments about the Inuit people he had encountered. With regard to their clothing, Best wrote, "In Sommer, they vse to weare the hearie side of their coates outwarde, and sometime go naked for too much heate. And in Winter (as by signes they haue declared) they weare foure or fiue folde vpõ their bodies with ye heare (for warmth) turned inward." As to their intellectual acumen, Best wrote, "These people in nature verye subtil, and sharpe witted, readie to conceiue our meaning by signes, and to make answere, well to be vnderstoode againe."[79] These observations by Best also underline the importance of manual signing and gestures among the Inuit people.

Finally, although Elizabeth I had instructed Frobisher to establish positive relationships with the Inuit, the first two expeditions evidently had bred such mistrust that relations could not be repaired. There were relatively few reports of signed communication with members of the Inuit population during the third voyage. By the time the English arrived in Baffin Island for the third time, its

inhabitants knew to stay well away from the strange men entering their territory. Though it was Frobisher who initially made contact possible and whose audacity led to substantial initial communication through signs and gestures, his behavior also had led him to alienate the very people who had early on offered to help him.

European Familiarity with the Use of Signs and Gestures to Communicate

Signed communication among hearing persons already had a long history in Europe by the time of Frobisher's first voyage. The use of manual and visual signs to communicate figured prominently in and was a well-established part of various monastic orders. In 909 AD, Bernon of Bourgogne founded the Order of Cluny in France. The Cluniac monks followed the Rule of Saint Benedict, which prescribed silence during certain periods of work throughout the day.[80] Bernon's successor, Saint Odo, decided that the existing Benedictine rules were too lax. Odo "imposed such a strict rule of silence upon his brethren that if one were to communicate it had to be through visual signs."[81] Though the Order of Cluny provides some of the earliest evidence for *codified* systems of monastic signing, there is evidence that signing was employed by earlier monastic orders. Even before the treatise of Saint Benedict, Saint Pachomius recommended periods of silence during monastic work, with explicit reference to signs.[82]

Silent monastic orders also had been established in England long before Frobisher's voyages. In 1050 AD, the Cloister of South-East England produced a list of 127 monastic signs, and a second English-language cloister published a list of 106 signs in the fifteenth century.[83] Monastic signs were closely tied to objects and concepts associated with the daily lives of their users. Though the meanings of the signs the monks used were fairly transparent, monastic sign systems were far from homogeneous, as there were different communication needs in each monastery. This use of codified gestures allowed monks to discuss essentials without disturbing the spiritual peace or contemplation of others. Even during periods of strict silence, monks often needed to communicate with one another about books, food, clothing, and various tasks, and signs allowed them to do so while retaining an atmosphere of quiet contemplation.[84]

Hearing Europeans used manual signs and gestures for a variety of communicative purposes other than monastic signing. Travel in Europe, often conducted for trade, regularly brought members of one linguistic community into contact with members of others. In these interactions across spoken-language barriers, it is likely that manual signs and gestures were used widely. Indeed, Gordon Hewes has surmised that "explicit reference to sign-communication is rare, not because it did not occur, but because resort to it has been taken for granted."[85] In addition to their use in trade and travel, manual gestures were also frequently employed as an aspect of entertainment in Europe during the Middle Ages. The most common form of gesture was pantomime, or the use of transparent signs or gestures

to convey concepts visually. Mimes relied on the members of their audiences to readily perceive the relationships between the gestures they produced and their meanings. Moreover, orators and preachers frequently would clarify their oral presentations by using a number of recognizable gestures.

These examples of relatively extensive use of signing and gesturing in Europe during and before the sixteenth century may help explain why Frobisher and his men recognized Inuit gestures as an attempt at communication. An account by Dionyse Settle, who joined Frobisher and his crew on their second and third voyages, describes the "dumbe signes" and "mute congratulations" the Inuit and English used to communicate when gifts were exchanged.[86] Though Settle had never seen an Inuit before his initial voyage with Frobisher, he evidently held a frame of reference for the system of communicative gestures the Inuit used.

Inuit Familiarity with Signs

Earlier in this chapter, we commented on the usefulness of manual-sign-communication systems to overcome spoken-language barriers that existed among the many Native American nations or tribes of North America. For much of North America, a manual-sign-communication system known as North American Indian Sign Language, or Plains Indian Sign Language, was used to facilitate intertribal communication.[87] But the linguistic situation of the Inuit on Baffin Island, and for much of the far northern region of North America, was quite different from that of the rest of the continent.

The population density of and the incidence of intertribal interaction on Baffin Island differed greatly from those in most of the rest of North America. Because of its harsh climate, Baffin Island cannot support either an agrarian society or large hunter-gatherer populations. As a consequence, tribes are few and far between, and the inhabitants of the region have little contact with one another.[88] Moreover, there are few records of intertribal contact between Baffin Island Inuit and their mainland counterparts. When there was intertribal interaction for trade, the evidence suggests that it was spoken language, not manual-sign communication, that was the primary means of communication.[89]

Manual signs used in hunting. As Settle's account of the second voyage confirms, hunting was a major aspect of Inuit culture. The Inuit hunted caribou, polar bears, seals, and hares as primary food sources.[90] All of these animals are sensitive to sound, so spoken communication during hunting expeditions often was antithetical to the success of the hunts. Silence was so important in these hunts that the occurrence of just a cough would often result in an animal's fleeing.[91]

Although some hunting may be a solitary pursuit, the successful hunting of medium- and large-sized animals often is a group activity.[92] At the time of the Frobisher voyages, the principal weapons the Inuit used were bows and arrows, darts (spears), and slings.[93] Hunters, using these weapons, typically would need to wound a large animal multiple times to bring it down. Also, the relatively short

range of these weapons would mean that the hunters would need to get close to their prey. To accomplish this, the movements of the hunters would need to be coordinated. To avoid being detected by the prey, manual signs or signals often would be used to effectively organize the hunters' actions.

Contemporary investigators William Divale and Clifford Zipin found that it was the use of manual signs to coordinate hunting activities that was the critical factor in the emergence of manual-sign communication in predominantly hearing societies.[94] More specifically, these investigators viewed sign communication as arising primarily in hunting and then becoming a preferred form of intertribal communication. In the case of Baffin Island, the barren, treeless landscape, infertile soil, and harsh climate meant that the inhabitants would need to rely primarily on hunting and fishing for their food. Moreover, the different Inuit tribes on Baffin Island were fairly isolated and only occasionally came into contact with one another. Nevertheless, accounts from Frobisher's voyages provide evidence not only that manual signs were used by the Inuit but also that they comprised a well-integrated means of communication that the Inuit immediately chose to adopt as a contact language when presented with the opportunity.

This use of manual signs in certain societies' hunting activities continues to the present day. A relatively recent account by George B. Silberbauer, in 1981, of the procedures followed and tactics employed by G/wi hunters of the central Kalahari Desert illustrates how manual signs and gestures may be used in a hunting expedition:

> A pair going out to their chosen hunting ground sets off not long after sunrise, walking at a good pace with the second man treading exactly in the footsteps of the first to minimize noise and avoid thorns. If they speak at all, it is in muted tones. Most communication is by hand signal. Tracks encountered on the way are commented on by means of gesture—the direction taken by the animal is shown by a wave: a fast wave for a gallop and a slow, wavering sweep of the hand for a grazing animal. The distance the animal is judged to have traveled since making the trail is indicated by the extent of the follow-through of the wave. A flick of the fingers shows that the trail is very fresh and that the animal is nearby; an upturned palm marks an old or fruitless set of tracks. There is a hand signal for each species of large mammal and for the small mammals and birds that are normally hunted—the fingers are held in positions imitating the shape of the head, with horns where appropriate, and the hand is moved in imitation of the animal's characteristic gait. . . . [T]he attack is worked out in a series of gestures and a whispered word or two.[95]

One can easily imagine Inuit hunters at the time of Frobisher's voyages, armed with many of the same weapons as the present-day G/wi, relying on similar

manual or gestural signals to communicate with one another in their pursuit of prey.

Additional evidence to support Divale and Zipin's theory of the role of hunting in the development of sign systems can be seen in ivory carvings found in Inuit-inhabited regions of Canada.[96] These carvings depict scenes of mammal hunting by the Inuit and display discrete, articulated signs. Furthermore, many of the same sign sequences are carved into wooden hunting implements themselves, presumably as a communication guide for less-experienced hunters.

Otitis media and deafness. Another factor that might account for the presence of a sign-communication system among the Inuit is the occurrence of deafness among tribal members; a relatively high incidence of deafness may have helped spur the development and use of manual signs. Given that the historical accounts from the sixteenth century do not include even speculations about the prevalence of deafness among the Inuit, we cannot say with any certainty that there were deaf tribal members among those Inuit who were present during the Frobisher explorations.

We do know today that otitis media (inflammation of the middle ear or middle-ear disease) affects Native American infants and children at a significantly higher rate than it does members of other demographic groups.[97] Indeed, the incidence of otitis media in Native Americans, and particularly among the Inuit, is alarmingly high.[98] The highest incidence in the world of the most severe form of otitis media, chronic suppurative otitis media,[99] exists among the Inuit of Alaska, Canada, and Greenland.[100]

What might account for this high incidence of otitis media? Various factors likely contribute. Middle-ear inflammation and discharge of pus often occur within a framework of poverty. Associated with the low socioeconomic levels of many Native Americans are ill-balanced diets, poor standards of hygiene, and limited access to health care.[101] There is also evidence that the very high incidence of the condition among the Inuit is attributable, in part, to anatomical differences that exist among various population groups.[102] These anatomical differences mean that Inuit children are much more likely to experience recurrent episodes of otitis media than children of Caucasian descent. Finally, in light of this predisposition for middle-ear disease, the lack of timely health care among the Inuit is a vital concern. As Daniel Ling, R. Hall McCoy, and Edward Levinson observed in 1969, "If middle ear disease were neglected, hearing loss would become progressively worse."[103]

Although the inhabitants of Baffin Island have a very high incidence of otitis media in infancy and childhood and some resultant hearing loss, it is not clear that this would be sufficient to spark manual-sign usage. It is possible that the experience of using signs in hunting might have helped lead the Inuit to employ signs to communicate with deaf members of their society. Or perhaps the reverse might be true: if there were a number of Inuit who were deaf and who used man-

ual signs to communicate, then those signs might have been adapted to hunting. Regardless, hearing loss does not seem to be a major impediment in contemporary Inuit society: "Even severe deafness, either among children or adults, was a matter of no social concern, . . . and constituted no serious handicap to the prevailing Eskimo [Inuit] way of life."[104] If many Inuit were adept at communicating manually, then this might explain why severe deafness was not a disabling condition.

Finally, it should be noted that the presence of even a small number of deaf persons within a particular tribal group evidently can spark both the emergence of a sign language and the acquisition of manual-sign communication by hearing members of that tribe. This pattern can be seen in the Urubú tribe reported on by Jim Kakúmasu in 1968. Kakúmasu writes that Urubú Sign Language probably developed as a consequence of the presence of a deaf population within the Urubú tribe. (The deafness rate within the tribe is approximately 1.7 percent.) Kakúmasu noted the presence of some deaf individuals in most of the Urubú villages he encountered, but he added that even when there were no mute individuals in a village, "our mute carrier had no difficulty communicating with the [hearing] villagers."[105] As in other Deaf sign languages around the world, Urubú signs typically are composed of standard hand shapes, locations, and sign movements. Although a similar role of hearing impairment and sign usage might have occurred among the Inuit, it should be pointed out that the hearing difficulties present in many Inuit were not present at birth but rather emerged during childhood. That is, unlike many Deaf persons among the Urubú who apparently were deaf from birth, those Baffin Island Inuit who are severely hearing impaired or deaf most likely grew up speaking and may only gradually have lost their hearing. If individuals lose their hearing postlingually, then they are likely to retain many of their spoken-language abilities.

Concluding Remarks

The sign communication employed by the Inuit with whom Martin Frobisher came into contact was likely cemented into their culture long before Frobisher's arrival. That the narratives of Frobisher's three voyages contain fairly substantial records of the use of signs by the Inuit in their interactions with the English explorers indicates that manual signing was not an uncommon or unpracticed activity among the Inuit. The primary communicative purpose of the signs used by the Inuit, however, probably differed from that of the Native Americans to their south, such as the Plains Indians. According to Mallery, the principal reason behind the widespread presence of manual signs in much of North America was their usefulness in overcoming *intertribal* communication barriers.[106] In the case of the Inuit, most manual communication would have occurred *intratribally.* Manual communication certainly would have occurred often during hunting expeditions, and may have facilitated communication among hearing-impaired members

of Inuit society. Furthermore, the fact that members of Frobisher's crew understood the importance of signing to the Inuit they encountered, combined with the crewmen's recourse to manual gestures or signs in their interactions with the Inuit, suggests that manual communication was part of many European explorers' knowledge base in the sixteenth century.

Although the accounts made by Frobisher's crew leave little doubt that the Inuit and the English explorers relied heavily on manual signs and gestures in their interactions, the written records of these interactions provide little information about the nature of the signs or gestures used. Except at a very general level, we do not know what the two parties tried to communicate to each other. The records identify neither what particular signs were used nor how they were formed. Most likely, both the Englishmen and the Inuit would have needed to rely heavily on signs with readily transparent meanings to overcome cultural and linguistic differences. This reliance on highly iconic signs would probably have been supplemented by the use of manual gestures, such as pointing. Moreover, even if members of one or both parties were fluent signers, the difficulties involved in communicating with someone unfamiliar with the others' signs and culture would probably have limited any exchanges to a very basic level. In addition to their use of manual signs and gestures, both parties would likely have relied on widely understood facial expressions to help in their communicative interactions.[107]

Finally, although many individuals in the nineteenth century expressed doubts about the occurrence of manual-sign communication among the Inuit, Mallery included in his report *Sign Language among North American Indians* an observation by Ivan Petroff to the contrary. Petroff had traveled extensively in Alaska. He claimed that he had witnessed native members of different Alaskan tribes "converse with each other only by means of signs and gestures."[108] This observation, together with the numerous accounts from the Frobisher voyages of signing by the Inuit of Baffin Island, should establish not only that communication through manual signs and gestures was present among the Inuit but also that their use probably was quite widespread.

Notes

1. Baffin Island today is part of northeast Canada. It is located west of Greenland and north of the Hudson Strait.
2. Garrick Mallery, *Sign Language among North American Indians Compared with That among Other Peoples and Deaf-Mutes* (Mineola, N.Y.: Dover, 2001), originally published in *First Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution, 1879–'80*, ed. J. W. Powell (Washington, D.C.: Government Printing Office, 1881), 263–552; Edward B. Tylor, *Researches into the Early History of Mankind and the Development of Civilization*, 3rd ed. (London: John Murray, 1878).
3. Lyle Campbell, *American Indian Languages* (New York: Oxford University Press, 2000); Peter Farb, *Man's Rise to Civilization as Shown by the Indians of North America from Primeval Times to the Coming of the Industrial State* (New York: Dutton, 1968); Shirley Silver and Wick R. Miller, *American Indian Languages: Cultural and Social Contexts* (Tucson: University of Arizona Press, 1997).

4. Mallery, *Sign Language among North American Indians.*
5. Campbell, *American Indian Languages;* Jeffrey Davis, *Hand Talk: Sign Language among American Indian Nations* (Cambridge: Cambridge University Press, 2010); Allan R. Taylor, "Nonspeech Communication Systems," in *Handbook of North American Indians,* ed. Ives Goddard (Washington, D.C.: Smithsonian Institution Press, 1996), 17:275–89.
6. Mallery, *Sign Language among North American Indians.*
7. John Wesley Powell, "Indian Linguistic Families of America North of Mexico," in *Seventh Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution, 1885–1886* (Washington, D.C.: Government Printing Office, 1891), 1–142.
8. Mallery, *Sign Language among North American Indians,* 326.
9. James McDermott, *Martin Frobisher: Elizabethan Privateer* (New Haven: Yale University Press, 2001).
10. Robert Ruby, *Unknown Shore: The Lost History of England's Arctic Colony* (New York: Holt, 2001).
11. Samuel Eliot Morison, *The European Discovery of America: The Northern Voyages A.D. 500–1600* (New York: Oxford University Press, 1971), 497.
12. McDermott, *Martin Frobisher,* 96.
13. Humphrey Gilbert (1537–1583) commanded the English forces in Ireland that fought against the Irish rebels. He was knighted in 1570 for his service in the campaigns in Ireland. Strongly advocating the existence of a northwest passage to China and India, his views inspired Martin Frobisher's voyages. In 1578, Queen Elizabeth I granted him a patent to establish colonies in America. In 1583, he reached what is now known as Newfoundland and took possession of it for England. On his return trip, his vessel was lost in a storm. His intellectual curiosity and interest in exploration were shared by his younger half brother, Walter Raleigh.
14. Ruby, *Unknown Shore,* 45.
15. Ruby, *Unknown Shore.*
16. McDermott, *Martin Frobisher,* 100.
17. Ruby, *Unknown Shore,* 29.
18. McDermott, *Martin Frobisher.*
19. Morison, *The European Discovery of America,* 500.
20. Ibid.
21. McDermott, *Martin Frobisher,* 100.
22. Ruby, *Unknown Shore.*
23. Although George Best accompanied Martin Frobisher on only the second and third voyages, Best provides accounts of all three voyages. He acquired the information needed to write his account of the first voyage by interviewing surviving members of that voyage.
24. George Best, *A True Discourse of the Late Voyages of Discoverie, for the Finding of a Passage to Cathaya, by the Northweast, under the Conduct of Martin Frobisher Generall,* reprinted in *The Three Voyages of Martin Frobisher in Search of a Passage to Cathay and India by the North-West, A.D. 1576–8: From the Original 1578 Text of George Best,* ed. Vilhjalmur Stefansson (New York: N. Israel/Da Capo, 1971).
25. Ruby, *Unknown Shore,* 46.
26. Stefansson, *The Three Voyages of Martin Frobisher,* 13.
27. Robert Baldwin, "John Dee's Interest in the Application of Nautical Science, Mathematics, and Law to English Naval Affairs," in *John Dee: Interdisciplinary Studies in English Renaissance Thought*, ed. Stephen Clucas (Dordrecht, Neth.: Springer, 2006), 97–130.
28. Nicholas H. Clulee, *John Dee's Natural Philosophy: Between Science and Religion* (London: Routledge, 1988).
29. Ruby, *Unknown Shore;* William H. Sherman, "John Dee's Columbian Encounter," in Clucas, *John Dee,* 131–40. Ferdinand Columbus, one of Christopher Columbus's sons, wrote an account of his famous father's encounters with the New World. This volume came into

the possession of John Dee. Dee evidently carefully read and annotated the book; these marginalia guided Sherman's analyses ("John Dee's Columbian Encounter"). Dee's notes concerned many of the practical aspects of Columbus's voyages, such as the building of forts, interactions with the native peoples, the exchange of nearly worthless items for things of value, and the seizure of native persons. Ferdinand Columbus also included in his volume observations about the use of manual communication and signs to overcome spoken-language barriers between the European explorers and the indigenous peoples (Ferdinand Columbus, *The Life of the Admiral Christopher Columbus, by His Son, Ferdinand,* trans. Benjamin Keen, rev. ed. [New Brunswick, N.J.: Rutgers University Press, 1992]). The first edition of this work was published in 1958.

30. The barks *Gabriel* and *Michael* had three masts each: the fore-, main-, and mizzenmasts. These vessels were about fifty feet long and probably weighed between twenty and thirty tons (Ruby, *Unknown Shore*). The *Gabriel* had on board a smaller vessel, which Frobisher and his crew used to explore the North American Arctic shore. A pinnace was a light sailing vessel often used as a tender for larger vessels. (A tender is a vessel used to attend to another ship's needs, such as for provisions or transportation to shore.)
31. The dates that were entered in the logs and the journal accounts of the three voyages were from the Julian calendar (Robert McGhee, *The Arctic Voyages of Martin Frobisher: An Elizabethan Adventure* [Seattle: University of Washington Press, 2001]). This calendar was about ten days behind the Gregorian calendar that is in general use today. The more accurate Gregorian calendar was not adopted in Great Britain and its American colonies until the middle of the eighteenth century.
32. David Beers Quinn, ed., *New American World: A Documentary History of North America to 1612,* vol. 4, *Newfoundland from Fishery to Colony, Northwest Passage Searches* (New York: Arno Press and Hector Bye, 1979), 201; Stefansson, *The Three Voyages of Martin Frobisher,* 149.
33. McDermott, *Martin Frobisher,* 135–37.
34. Quinn, *New American World,* 205; Stefansson, *The Three Voyages of Martin Frobisher,* 151.
35. Quinn, *New American World,* 205.
36. Ibid., 193; McDermott, *Martin Frobisher,* 137–38.
37. Quinn, *New American World,* 205; Stefansson, *The Three Voyages of Martin Frobisher,* 151.
38. Quinn, *New American World,* 206.
39. McDermott, *Martin Frobisher,* 139.
40. Quinn, *New American World,* 206.
41. Ruby, *Unknown Shore,* 68.
42. Quinn, *New American World,* 207.
43. Ruby, *Unknown Shore,* 71.
44. McDermott, *Martin Frobisher,* 144.
45. Quinn, *New American World,* 207.
46. See John D. Bonvillian, Vicky L. Ingram, and Brendan M. McCleary, "Observations on the Use of Manual Signs and Gestures in the Communicative Interactions between Native Americans and Spanish Explorers of North America: The Accounts of Bernal Díaz del Castillo and Álvar Núñez Cabeza de Vaca," *Sign Language Studies* 9 (2009): 132–65; Richard Hakluyt, *The Principal Navigations, Voyages, Traffiques, and Discoveries of the English Nation: Made by Sea or Overland to the Remote and Farthest Distant Quarters of the Earth at Any Time within the Compasse of These 1600 Yeares*, vol. 7 (1599; facsimile ed., Glasgow: James McLehose and Sons, Publishers to the University, 1904); and Ruby, *Unknown Shore.*
47. Morison, *The European Discovery of America,* 507.
48. Hakluyt, *The Principal Navigations, Voyages, Traffiques, and Discoveries of the English Nation,* 210.
49. Ibid.
50. Ibid.

51. Ruby, *Unknown Shore,* 75.
52. Hakluyt, *The Principal Navigations, Voyages, Traffiques, and Discoveries of the English Nation,* 210.
53. Ruby, *Unknown Shore,* 76.
54. Ibid.
55. Hakluyt, *The Principal Navigations, Voyages, Traffiques, and Discoveries of the English Nation,* 209.
56. Though the term *Tartars* is used in modern parlance to refer to various peoples inhabiting parts of Russia or Eastern Europe, Europeans in centuries before the time of Frobisher often used the word to describe persons of Mongolian or Asian descent (Laurence Bergreen, *Marco Polo: From Venice to Xanadu* [New York: Knopf, 2007]).
57. Ruby, *Unknown Shore,* 76.
58. Ruby, *Unknown Shore;* McDermott, *Martin Frobisher,* 153–58.
59. Ruby, *Unknown Shore,* 81–83.
60. McDermott, *Martin Frobisher.*
61. Hakluyt, *The Principal Navigations, Voyages, Traffiques, and Discoveries of the English Nation;* McDermott, *Martin Frobisher;* Ruby, *Unknown Shore.*
62. Hakluyt, *The Principal Navigations, Voyages, Traffiques, and Discoveries of the English Nation,* 217.
63. McDermott, *Martin Frobisher,* 176.
64. Hakluyt, *The Principal Navigations, Voyages, Traffiques, and Discoveries of the English Nation,* 221–22.
65. Ibid., 222.
66. Ibid.
67. Ibid., 222–23.
68. McDermott, *Martin Frobisher,* 176.
69. Ibid., 180; Ruby, *Unknown Shore,* 148–49.
70. Hakluyt, The Principal Navigations, Voyages, Traffiques, and Discoveries of the English Nation, 228.
71. Ibid., 227.
72. Ibid., 228.
73. McDermott, *Martin Frobisher.*
74. Quinn, *New American World,* 220. The finding of the box of nails in the Inuit camp suggests that some Inuit people engaged in at least sporadic trade with Europeans or people of European descent prior to Frobisher's arrival. There are a couple of reasons for this claim. One is that there was no evidence that the Inuit people of this period (or the forest Indians on the other side of the Hudson Strait) were the skilled metalworkers needed to produce such nails. A second reason is that the Inuit encountered by Frobisher and his men appeared to be experienced in trading merchandise. There is also evidence that the Norse people of Greenland had periodically been present on Baffin Island long before Frobisher arrived in the 1570s (Heather Pringle, "Vikings and Native Americans," *National Geographic* 222, no. 5 [2012]: 80–93; Patricia D. Sutherland, "The Norse and Native North Americans," in *Vikings: The North Atlantic Saga,* ed. William W. Fitzhugh and Elisabeth I. Ward [Washington, D.C.: Smithsonian Institution Press, 2000], 238–47).
75. Quinn, *New American World,* 220.
76. Hakluyt, *The Principal Navigations, Voyages, Traffiques, and Discoveries of the English Nation;* McDermott, *Martin Frobisher.*
77. McDermott, *Martin Frobisher.*
78. Ruby, *Unknown Shore.*
79. Stefansson, *The Three Voyages of Martin Frobisher,* 124.
80. John D. Bonvillian, Nicole A. Kissane, Tracy T. Dooley, and Filip T. Loncke, "Use of Manual Signs and Gestures by Hearing Persons: Historical Perspectives," in "Simplified Signs:

A Manual Sign-Communication System for Special Populations," vol. 1, "Principles, Background, and Application" (unpublished draft, last edited August 23, 2013), 15; alternately, Robert Barakat, "Cistercian Sign Language," in *Monastic Sign Languages,* ed. Jean Umiker-Sebeok and Thomas A. Sebeok (Berlin: Mouton de Gruyter, 1987), 67–322; and Scott G. Bruce, *Silence and Sign Language in Medieval Monasticism: The Cluniac Tradition, c. 900–1200* (Cambridge: Cambridge University Press, 2007).

81. Barakat, "Cistercian Sign Language," 89.
82. Ibid., 88.
83. Gérard van Rijnberk, "Le langage par signes chez les moines," in Umiker-Sebeok and Sebeok, *Monastic Sign Languages,* 13–25.
84. Ibid., 23. For more detail, see Eric Buyssens, "Le langage par gestes chez les moines," in Umiker-Sebeok and Sebeok, *Monastic Sign Languages,* 27–37, originally published in *Revue de l'Institute de Sociologie* 29 (1956): 537–45, in which he details the signs of Cluniac and Trappist monks and their functions. Additionally, Robert Barakat, *The Cistercian Sign Language: A Study in Non-verbal Communication* (Kalamazoo, Mich.: Cistercian Publications, 1975), has compiled a dictionary of Cistercian signs; it includes photographs of signs being produced.
85. Gordon W. Hewes, "Gesture Language in Culture Contact," *Sign Language Studies* 4 (1974): 5.
86. Hakluyt, *The Principal Navigations, Voyages, Traffiques, and Discoveries of the English Nation,* 216.
87. Jeffrey Davis, "A Historical Linguistic Account of Sign Language among North American Indians," in *Multilingualism and Sign Languages: From the Great Plains to Australia,* ed. Ceil Lucas (Washington, D.C.: Gallaudet University Press, 2006), 12:3–35; Davis, *Hand Talk.*
88. Marianne Mithun, *The Languages of Native North America* (New York: Cambridge University Press, 1999), 406.
89. Ibid., 493.
90. Hakluyt, *The Principal Navigations, Voyages, Traffiques, and Discoveries of the English Nation;* Ruby, *Unknown Shore.*
91. Ruby, *Unknown Shore.*
92. William T. Divale and Clifford Zipin, "Hunting and the Development of Sign Language: A Cross-Cultural Test," *Journal of Anthropological Research* 33 (1977): 185–201.
93. Hakluyt, *The Principal Navigations, Voyages, Traffiques, and Discoveries of the English Nation,* 226.
94. Divale and Zipin, "Hunting and the Development of Sign Language."
95. George B. Silberbauer, *Hunter and Habitat in the Central Kalahari Desert* (Cambridge: Cambridge University Press, 1981), 209–11.
96. Walter J. Hoffman, *The Graphic Art of the Eskimos* (1897; repr. from an original copy in the collections of the University of Alaska Library, New York: AMS Press, 1975).
97. Charles D. Bluestone and Jerome O. Klein, *Otitis Media in Infants and Children,* 4th ed. (Hamilton, Ontario: Decker, 2007). Otitis media is an inflammation of the middle ear that occurs primarily in infancy and early childhood. Episodes of otitis media are often marked with pain, fever, and hearing loss. When otitis media with effusion occurs, there is a collection of liquid in the middle-ear space. This effusion may persist for weeks to months and is associated with some loss of hearing. Frequency of episodes of otitis media (Dwayne Reed, Susan Struve, and James E. Maynard, "Otitis Media and Hearing Deficiency among Eskimo Children: A Cohort Study," *American Journal of Public Health* 57 [1967]: 1657–62) and its most severe form, chronic suppurative (indicating the discharge of pus) otitis media (Brian W. Blakley and Steve Kim, "Does Chronic Otitis Media Cause Sensorineural Hearing Loss?" *Journal of Otolaryngology* 27 [1998]: 17–20), in particular have been associated with sensorineural hearing loss.
98. J. D. Baxter, "Otitis Media in Inuit Children in the Eastern Canadian Arctic: An Overview,

1968 to Date," *International Journal of Pediatric Otorhinolaryngology* 49 (1999): S165–68; Charles D. Bluestone, "Epidemiology and Pathogenesis of Chronic Suppurative Otitis Media: Implications for Prevention and Treatment," *International Journal of Pediatric Otorhinolaryngology* 42 (1998): 207–23; Sue Anne Hammond and Linda Hager Meiners, "American Indian Deaf Children and Youth," in *Multicultural Issues in Deafness,* ed. Kathee M. Christensen and Gilbert L. Delgado (White Plains, N.Y.: Longman, 1993), 143–66; Gary J. Kaplan et al., "Long-Term Effects of Otitis Media: A Ten-Year Cohort Study of Alaskan Eskimo Children," *Pediatrics* 52 (1973): 577–85; Daniel Ling, R. Hall McCoy, and Edward D. Levinson, "The Incidence of Middle Ear Disease and Its Educational Implications among Baffin Island Eskimo Children," *Canadian Journal of Public Health* 60 (1969): 385–90; Damian A. McShane and Jeanne M. Plas, "Otitis Media, Psychoeducational Difficulties, and Native Americans: A Review and a Suggestion," *Journal of Preventive Psychiatry* 1 (1982): 277–92; Reed, Struve, and Maynard, "Otitis Media and Hearing Deficiency among Eskimo Children."

99. Peter S. Morris and Amanda J. Leach, "Acute and Chronic Otitis Media," *Pediatric Clinics of North America* 56 (2009): 1383–99.
100. Bluestone, "Epidemiology and Pathogenesis of Chronic Suppurative Otitis Media."
101. Hammond and Meiners, "American Indian Deaf Children and Youth"; Ling, McCoy, and Levinson, "The Incidence of Middle Ear Disease and Its Educational Implications among Baffin Island Eskimo Children"; Patrick Manning, Mary Ellen Avery, and Alan Ross, "Purulent Otitis Media: Differences between Populations in Different Environments," *Pediatrics* 53 (1974): 135–36; McShane and Plas, "Otitis Media, Psychoeducational Difficulties, and Native Americans."
102. Bluestone, "Epidemiology and Pathogenesis of Chronic Suppurative Otitis Media."
103. Ling, McCoy, and Levinson, "The Incidence of Middle Ear Disease and Its Educational Implications among Baffin Island Eskimo Children," 386.
104. Ibid., 388.
105. Jim Kakúmasu, "Urubú Sign Language," *International Journal of American Linguistics* 34 (1968): 275.
106. Mallery, *Sign Language among North American Indians*.
107. Paul Ekman, *Emotions Revealed: Recognizing Faces and Feelings to Improve Communication and Emotional Life* (New York: Times Books [Holt], 2003).
108. Ivan Petroff, cited in Mallery, *Sign Language among North American Indians*, 493.

11

BULWER'S SPEAKING HANDS

Deafness and Rhetoric

JENNIFER NELSON

> Reason and the sayings of the learned ancients . . .
> prove these cosmetic gestures of the hand to be things of
> great moment and the very palm and crown of eloquence.
> —*John Bulwer,* Chironomia

Gesture and eloquence, mind and body: for John Bulwer, rhetorician, these things are intertwined through physical, manual, bodily movements. Bulwer's preoccupation with the body and its movements has caused a modern critic to humorously dub him a seventeenth-century muscleman.[1] Muscles and their motions do abound in Bulwer's works; his 1644 *Chirologia* and *Chironomia* deal with the many expressive gestures that may be used in public speaking and that can be sculpted to an art.[2] As can be seen on its title page, *Chirologia* focuses on the various natural expressions of the hands and their meanings—"pronunciation"—and *Chironomia* focuses on the art of rhetoric, in which carefully controlled bodily movements strongly figure. His *Pathomyotomia* (1649) deals with facial muscles, movements, and expressions, and his *Philocophus; or, The Deafe and Dumbe Mans Friend* (1648) deals with deaf people, their sign language, and a proposed school for the deaf.[3] For Bulwer, motion is what makes a human a perfect creature,[4] whether it is expression through the motions of the hands, fingers, face, larynx, or lips. Bulwer notes that speech and "Words are nothing else but Motion";[5] this is the moment when speech and manual signs share a common ground for him. He indicates, many times over in his works, that motion in whatever form is the universal thing binding all people. Rhetoric is composed of motions, and consequently so are the sign languages of the deaf. Gestures, as the "universall language of Humane nature," are what the deaf have in common with hearing people,[6] and Bulwer appropriates this knowledge to anticipate the elocutionary movement in rhetoric.

Bulwer changed the face of rhetoric by turning it back to the somewhat lost classic canon delivery; by rescuing it bodily from a mostly mental, postclassical emphasis on invention and style; and by ushering in a renewed consideration of performance as persuasion that would unfold even more fully in another hundred

years, with the elocutionary movement's emphasis on the role that the body plays in public speaking. Where did Bulwer's rhetorical precociousness come from? And how exactly does deafness fit in with his ideas on rhetoric? After all, people do naturally gesture when they speak, to punctuate, enhance, or forcibly draw attention to their words; such gesturing is what *Chirologia* and *Chironomia* are about, with only slight notice given to deaf people. However, I argue that Bulwer's manual rhetoric is largely underpinned by the presence of deaf people and their sign language in his life; they had a much greater influence on this rhetorical enterprise than is generally thought or known. That influence is indicated by Bulwer's *Philocophus,* where he praises deaf people, their sign language, and their intellectual capacities; he also acknowledges his debt to deaf people in this book. That Bulwerian elocution and rhetoric have been influenced by the sign language of the deaf is clearly stated in *Philocophus:* "This language you [the deaf Gostwicke brothers] speak so purely, that I who was the first that made it my Darling study to interpret the naturall richnesse of our discoursing gestures, not onely to the distinguishing of all the Corporall and Nationall Dialects thereof, and regulating the naturall as Accessories and Adjuncts of Rhetoricall Elocution; but to the following of them downe to their spring heads and originall, even to the finding out their Radicall Derivations and Muscular Etymologies . . ."[7] That he applied his "Darling study" of "our discoursing gestures" to the "Accessories and Adjuncts of Rhetoricall Elocution" is manifestly stated here. His notice of specific deaf people and their already existing sign language had an effect on his "regulating" and furthering of rhetorical speech through gestures.

Bulwer personally knew a number of deaf people in his time, such as Mr. Crisp, brother of Sir Nicholas Crisp, and he was apparently related by blood to the deaf Gostwicke brothers;[8] these brothers are in the dedication of *Philocophus,* which also lists a fair number of deaf people in the seventeenth-century deaf community in England. Moreover, evidence gleaned from Bulwer's will indicates that he adopted and provided for a possibly deaf child named Chirothea—literally, one who uses sign language.[9] These interactions with deaf people indicate a greater influence on Bulwer's rhetoric—and therefore on the rhetorical tradition—than might be supposed from his *Chirologia* and *Chironomia,* which cite Greek and Roman orators, philosophers, politicians, and teachers, as well as other great names, in support of his enterprise rather than deaf people. It is *Philocophus* that truly indicates his use of sign language in behalf of eloquence. Kristiaan Dekesel hints at this influence as well: he notes that the Gostwicke brothers and Chirothea were likely the "motivation behind these two treatises [*Chirologia* and *Chironomia*]."[10]

In deafness, Bulwer found a space where gestures and speech intersect, and in this space deafness, ironically, is used to support eloquence. In his conflation of gestures and speech on the plane of bodily motions, Bulwer embodies the elocutionary movement's focus on the issue of delivery through the controlling of the various parts of the body and its motions, as well as voice modulation, matters

that arise from nature and its "imprints." In a joint publication of *Chirologia* and *Chironomia*, he writes that nature

> imprints upon the body the active hints of her most generous conceits, darting her rays into the body, as light has its emanation from the sun; which eloquent impressions, a kind of speech most consonant to the mind, are in the moving of the hand so neatly wrought and emphatically produced that the hand many times seems to have conceived the thought. He, therefore, that would purchase the repute of an accomplished rhetorician must pursue the knowledge of this art which consists in understanding the lawful garb and ordered motions of the hand, the most puissant agent of the soul, and which hath by some been called mens corporis, or the mind of the body; [thus we have] the voice of philosophy.[11]

Bulwer is very taken with the idea that the art of public speaking depends on the natural connection between the mind and the body, which is epitomized in gesture as a "substitute and vicegerent *[sic]* of the tongue" (15). Gestures are as valid as the tongue, and they are "the mind of the body."

A knowledge of the attitudes and background of the time preceding Bulwer helps us appreciate his insistence on the importance of gesture and the body in the art of persuasion. Early modern England generally believed that eloquence was speech and that to be a true human being, one had to hear and therefore speak.[12] An account written roughly ninety years before Bulwer wrote his works makes even more clear the speech-and-hearing bias that permeated society. Thomas Wilson, in the *Arte of Rhetorique*, says that God,

> [s]till tendering his own workmanship, stirred up his faithful and elect, to persuade with reason, all men to society. And gave his appointed ministers knowledge both to see the natures of men, and also granted them the gift of utterance, that they might with ease win folk at their will, and frame by reason to all good order.
>
> And therefore, whereas men lived Brutishly in open fields, having neither house to shroud them in, not attire to clothe their backs, nor yet any regard to seek their best avail: these appointed of God called them together by utterance of speech, and persuaded them what was good, what was bad, and what was gainful for mankind. And although at first, the rude could hardly learne, and either for strangeness of the thing, would not gladly receive the offer, or else for lack of knowledge could not perceive the goodness: yet being somewhat drawn and delighted with the pleasantness of reason, and the sweetness of utterance: after a certain space, they become through nurture and good advisement, of wild, sober: of cruel, gentle: of

> fools, wise; and of beasts, men. Such force hath the tongue, and such is the power of eloquence and reason, that most men are forced even to yield in that, which most standeth against their will.[13]

With Wilson as a predecessor, Bulwer attempts to write gestures and corporeality against a historically established religious and rhetorical body of work where the tongue is the "power of eloquence and reason," because only through utterance does God's appointed call those who live "Brutishly" and convert them to reason and civilization.

In contrast to Wilson's insistences on vocal utterance, Bulwer sees manual signs in a valid light, in that hands are capable of a sort of speech: *Chirologia* is "Composed of the Speaking Motions, and Discoursing Gestures thereof." He notes that the use of manual signs is the "naturall language of the Hand" (1). He points out here that there is no compelling reason that people should talk: " 'Tis apparent, that there's no native law, or absolutely necessity, that those thoughts which arise in our pregnant mind must by mediation of our tongue flow out in a vocal steam of words." This statement is a prelude to the idea that deaf people can sign as hearing people can talk: "A notable argument we have of this discoursing faculty of the hand in our common jesters who without their manners, fashions and significant actions of men; which [argument] may be more confirmed by that wonder of necessity which nature worketh in men that are born deaf and dumb who can argue and dispute rhetorically by signs, and with a kind of mute and logistic eloquence overcome their amazed opponents; wherein some are so ready and excellent, they seem to want nothing to have their meanings perfectly understood" (17). Bulwer here assigns eloquence and rhetorical power directly to the signs of the deaf and, in so doing, recognizes the deaf and their use of sign language. He further appears to privilege gestures by saying that the number of gestures exceeds the "numerical store of words"; he proceeds to give a long list of the things that can be expressed through gestures (20). A section titled "Dactylogia" in *Chirologia* discourses on the capabilities of the hands in elocution: "And as we can translate a thought into discoursing signs, so the conceptions of our mind are seen to abound in several dialects while the articulated fingers supply the office of a voice" (120). Voice is provided as much by the fingers as by the mouth.

Beyond the eloquence inherent in gestures, Bulwer further invokes religion to support his argument that gestures are valid as carriers of meaning. In religion, he notes, the body is superior to the tongue, because "the general language of the body, is more vocal and effectual than the explications of the tongue, and more religiously true to the soul" (31). He also writes that "the hands and blessing seem to be conjugates in the school both of nature and grace" and that benediction is "a natural right near allied unto the hand and of spiritual affinity with prayer" (110).

Not only does Bulwer invest gestures with heavy rhetorical eloquence and

religious significance, but also his method of analyzing gestures emphasizes his devotion to the belief that manual signs are of paramount importance in public speaking. From *Chirologia*'s detailed explications of various significant gestures (such as "I reprove," "I extol"), one can see that he is remarkably sensitized to gestural visual effects and their physical production, a very deaf quality, one that may have arisen from his experience with the deaf and their sign language. He is also visually attuned in his constant use of chirograms throughout his books. His works stress the importance of gestures as the "crown of eloquence" in a concrete, almost bodily way through the rare visual presentation of many chirogrammatic plates, which portray drawings of hands and their proper shapes. For example, the illustration for invite ("I invite") shows a hand upturned and curved gracefully inward, toward the speaker's body (51, 115). To extend the middle finger is "a natural expression of scorn and contempt" (132, 143). Bulwer's rhetorical orderings of manual movements are clear when he says these tables of gestures, "besides their typicall signification, are so ordered to serve for privy cyphers for any secret intimation" (142). Not only do gestures have a typical, clear meaning for many, but also they can serve as abstract "privy cyphers" of meaning, much as words and sign-language signs do.

From *Chirologia*, Bulwer moves to *Chironomia* and its chirograms, which he calls "the Art of Manuall Rhetorique . . . with the Canons, Laws, Rites, Ordinances, and Institutes of RHETORICIANS, both Ancient and Modern, Touching the Artificiall managing of the HAND in Speaking. Whereby the Naturall GESTURES of the HAND, are made the Regulated Accessories or faire-spoke adjuncts of RHETORICAL utterances. With TYPES, or CHIROGRAMS: A new illustration of this Argument" (145). In *Chironomia,* he continues the vein of thought he started in *Chirologia,* that the hand is fully capable of eloquence in its own right. In fact, gestures easily win out over the mouth, because they can function by themselves, whereas speech cannot function properly without gestures: "Whereas man by a happy endowment of nature is allowed two instruments, speech and a hand, to bring his concealed thoughts unto light; the tongue, without the hand, can utter nothing but what will come forth lame and impotent, whereas the hand, without the discourse of the tongue, is of admirable and energetical efficacy, and hath achieved many notable things" (156–57). He eloquently insults further the impotent, gestureless mouth and says that gestures enhance speech greatly, as there is a lack in speech that gestures fill: "Speech divided from the hand is unsound, and, brought into a poor and low condition, [it] flags and creeps upon the ground. The babbling tongue (indeed) may have a long and spacious walk, and the full mouth may prate and run o'er with large and loud impertinencies; but without the concurrence of the hand, the mouth is but a running sore and hollow fistula of the mind" (157). He praises the hand in conjunction with the mouth. Moreover, he clearly idealizes the hand and universalizes gestures, as when he says that not only "doth the hand in one speech or kind of language serve to intimate and express

our mind: it speaks all languages and as an universal character of reason, is generally understood and known by all nations among the formal differences of their tongue. And being the only speech that is natural to man, it may well be called the tongue and general language of human nature which, without teaching, men in all regions of the habitable world do at the first sign most easily understand" (16).

Bulwer has been accused by Stephen Greenblatt and others of being overly utopian and idealistic in praising gestures so highly and proffering them as the perfect universal language of human beings. Bulwer does seem to overstate the potential of gestures, for, his utopian impulse notwithstanding, signs made by the hands are just as referential as words issuing from the mouth. It can be argued, however, that he is talking about motion as a universal impulse, given that he says that if people didn't move in one way or another, they would be like plants. Does Bulwer really subscribe to the myth that sign language is universal? Dekesel thinks he simply "meant that gestures are a universal phenomenon, that they are in use all over the world."[14]

As in *Chirologia* and *Chironomia*, Bulwer in *Philocophus* opines that speech has more "life and efficacy" when joined with gestures.[15] He continues explicating his belief in the universality of motion: "To speak, is nothing else but by certain motiuncles [*sic*] of the Tongue and Lips, to intimate and signifie certaine things, as it is agreed between those that speak together" (29). He also notes that speech doesn't require a "voyce," but it requires motion; it can "produce mute and inaudible articles of Elocution" (49). Again we have an elocution that results from lip motions and not specifically from the sound of the voice itself. As a result of his motion-based philosophy of universality, Bulwer stresses the idea that the use of the voice over hands is arbitrary: if speech were wholly natural, we'd speak without teaching, and speech is "compacted or performed by use and custome" (133, 136). This observation opens the gateway to the idea of the deaf as being able to communicate in a form that is not automatically speech, an idea that would have been a radical concept for the general public of that time: "What though you cannot expresse your mindes in those verball contrivances of mans invention; yet you want not speech, who have your whole Body, for a Tongue, having a language more naturall and significant, which is common to you with us, to wit gesture, the general and universall language of Humane nature" (a3r–a3v). In his motional philosophy, Bulwer creates a viable, equal, even arguably exalted space for gestures and sign languages, a space where the deaf and their sign language have changed the face of rhetoric. Not only does he use his familiarity with deaf people and sign language to extend the field of rhetoric, but also he validates sign language and encourages the development of the intellect of deaf people. He writes at length in *Philocophus* about the legal and intellectual indignities visited on deaf people and proposes a school for the deaf. He insists that sign language can be used as the pathway to learning to read and write—and perhaps even to speech. Strangely enough, though Bulwer sees gestures as being able to function

alone without speech, even he ends up with a speech bias, in that he theorizes the ultimate goal of the learning of speech through sign language. However, anything else would have been too radical for his audience.

The influence exerted on Bulwer's rhetoric by the presence of the deaf and their sign language in his life brings up a number of issues and implications that beg discussion, such as whether this influence helps validate the sign language of the deaf and what the nature of this influence is. For Bulwer, deafness and the deaf body in language are the ground on which his rhetorical arguments are built, ironic as that may sound. His rhetoric depends on a metaphor, that of the silent deaf body, for the deaf and their sign language are still largely absent from his art of speech, even as he uses his familiarity with deafness and deaf people to apply gestures as a supplement to or replacement for oratory. Bulwer's art of rhetoric may be seen to be erected on an Irigarayan "silent ground" of deafness—Luce Irigaray argues that the patriarchal thinker builds his discourse on the silent ground of woman[16]—and in that way Bulwer appropriates and reconstitutes the faces of deafness, although his intentions are good, considering that he thought highly of gestures in the face of a long speech-based rhetorical tradition. Though he sees universality in motion and therefore validates the sign language of the deaf as he knows it through people like Chirothea, the Gostwickes, and Mr. Crisp, in actual practice gestures function as the "bearer of cultural information" and participate in the production of meanings,[17] which are artificial and restricted by society. The deaf aren't ultimately equalized through their use of gestures, because for society gestures must ultimately be a means to prop up the mouth rather than to function alone. Bulwer moves from a recognition of sign language to a discussion of how it can be used as a gateway to speech. Bulwer both validates and appropriates deafness, and in his doing so deafness functions as an insight for hearing people. Disability presented as insight, metaphor, or helpmate is a common, although not always politically appropriate, approach to disability studies, because it contributes something to an abled population.

In the end, however, Bulwer's idea of educating the deaf was a relatively new notion in his time; it predated institutionalized deaf education by a hundred years. It was in the mid-1700s when Abbé l'Epée of France pioneered deaf education, through sign language, on a mass scale. According to Dekesel, "Before [Abbé l'Epée's] time, educating a deaf person was hardly thought of as possible, but by the time he was finished, general opinion had started to imagine it feasible."[18] Bulwer's knowledge and use of deafness contribute significantly to his writings on elocution, and this knowledge also makes him probably the first British person to write emphatically about deafness and sign language in any depth. Dekesel dubs him the "founding father of British sign language research."[19] Gestures therefore serve as a two-way street between deaf and hearing people, even though speech on both sides is the ultimate goal.

Notes

1. Stephen Greenblatt, "Toward a Universal Language of Motion: Reflections on a Seventeenth Century Muscle Man," in *Choreographing History,* ed. Susan Leigh Foster (Bloomington and Indianapolis: Indiana University Press, 1995).
2. John Bulwer, *Chirologia; or, The Naturall Language of the Hand: Composed of the Speaking Motions, and Discoursing Gestures Thereof. Whereunto is Added Chironomia; or, The Art of Manual Rhetoricke: Consisting of the Naturall Expressions, Digested by Art in the Hand, as the Chiefest Instrument of Eloquence* (London: Thos. Harper, sold by Richard Whitaker, 1644).
3. John Bulwer, *Pathomyotomia; or, A Dissection of the Significant Muscles of the Affections of the Minde* (London: W. W. for Humphrey Moseley, 1649); John Bulwer, *Philocophus: or, The Deafe and Dumbe Mans Friend* (London: Humphrey Moseley, 1648).
4. Greenblatt, "Toward a Universal Language of Motion," 26–27.
5. Bulwer, *Philocophus,* 19.
6. Ibid., a3v–a4r.
7. Ibid.
8. Kristiann Dekesel, "John Bulwer: The Founding Father of BSL Research," *Signpost: The Newsletter of the International Sign Linguistics Association,* Winter 1992–Spring 1993, 41.
9. Ibid., 12.
10. Ibid., 13.
11. John Bulwer, *Chirologia; or, The Naturall Language of the Hand, and Chironomia; or, The Art of Manual Rhetoric,* ed. James W. Cleary, Landmarks in Rhetoric and Public Address (Carbondale: Southern Illinois University Press, 1974), 170–71. Subsequent references to this work appear parenthetically in the text.
12. This speech bias is borne out by the literal absence of the deaf as real people from the literature of the time, except for occasional, brief, usually allegorical mentions of them, such as of Abessa in Spenser's *Faerie Queene*: "But the rude wench her answer'd naught at all, / She could not hear, nor speak, nor understand" (1.3.11). Here, deafness for Abessa means that she is allegorically "outside the sphere of divine salvation." A discussion of this topic may be found in Jennifer L. Nelson and Bradley S. Berens, "Spoken Daggers, Deaf Ears, and Silent Mouths: Fantasies of Deafness in Early Modern England," in *The Disability Studies Reader*, ed. Lennard Davis, 1st ed. (New York: Routledge, 1997). Deafness is also often used as a metaphor or as an exercise in power. Shakespeare has numerous references to deafness and dumbness, as when the prince tells Romeo he will be "deaf to pleading and excuses" (*Romeo and Juliet* 3.1.192). To play deaf is to engage in an exercise in power, but this exercise works only if one can hear and is a member of an aural society. See Nelson and Berens for a long discussion of deafness and its various functions in early modern literature.
13. Thomas Wilson, *Arte of Rhetorique: The Renaissance Imagination,* ed. Thomas J. Derrick (New York: Garland, 1982), 18–19.
14. Dekesel, "John Bulwer," 39.
15. Bulwer, *Philocophus,* a3v. Subsequent references to this work appear parenthetically in the text.
16. Toril Moi, *Sexual/Textual Politics: Feminist Literary Theory* (London: Routledge, 1985), 131.
17. Susan Leigh Foster, "Choreographing History," in Foster, *Choreographing History,* 14.
18. Dekesel, "John Bulwer," 45.
19. Ibid., 11.

IV

SENSORY **GAINS**

12

SEEING THE WORLD THROUGH DEAF EYES

MATTHEW DYE

In December 2012, the *New York Times* ran a story about deaf police officers in the Mexican city of Oaxaca.[1] These officers were employed to work in the command room, monitoring closed-circuit-television cameras for suspicious activity. Although the reason for their employment was initially to read lips on video that had no audio, the article suggested that the deaf officers' suitability for the task stemmed from heightened visual attention and their not being distracted by auditory noise in the command room—phones ringing, police-radio chatter, and so forth. Indeed, many deaf people report heightened abilities in the visual modality. On the surface, this appears to be a clear example of Deaf Gain; a lack of hearing is compensated for by enhanced vision. The same narrative is seen in the case of blind individuals. For example, it is tempting to point to the large number of famous blind musicians as evidence that being blind leads to heightened auditory abilities. However, the story is not quite so straightforward. The reason that there are more famous blind musicians than one might expect, given the low incidence of congenital blindness, could be the different environment that results from growing up as a blind person. It is possible that blind children are presented with more opportunities to participate in musical activities and to learn how to play a musical instrument than are sighted children. In the same vein, one could argue that deaf people have enhanced visual skills because they use a visual language such as American Sign Language (ASL). It is therefore important to collect empirical data from well-designed experiments in order to determine exactly what changes occur in the visual system as a result of deafness, and what factors explain those changes. In this chapter, we will look at psychological studies of visual-processing deaf adults and children, and consider what they tell us about gains in the visual abilities of the deaf. As will become clear, the picture is complex, with very specific changes in visual processing being documented. Furthermore, we shall see that it is not appropriate to generalize from deaf adults to performance in deaf children, or across different populations of deaf individuals. Along the way, we will consider whether changes that occur in the visual system are a result of Deaf Gain or whether the use of a visual sign language is the driving

force and thus may be more properly characterized as Sign Gain. Let us ask what the psychological study of visual processing tells us about what it is like to see the world through deaf eyes.

Seeing, Perceiving, and Attending

Before we proceed further, it is important to make a distinction between sensation, perception, and attention. Although in everyday language these terms are often used interchangeably, they have specific psychological meanings. *Sensation* refers to the way in which information from the external world is processed by the sensory organs. In the case of vision, this means the way in which the retina responds to light reflected from the surface of physical objects. Light falling on the retina causes photoreceptors to become active, resulting in the passing of neural signals along the optic nerve and through a series of subcortical structures until they arrive in the primary visual cortex (V1). Even at the point of activity in the retina, there is a large amount of information processing. Indeed, our view of the world is shaped by the way the human retina responds to light. Other animals with different types of eye have a different visual experience of the world, for example, being able to see body heat by responding to light at near-infrared wavelengths.

Perception is the process by which the human brain interprets the signals that propagate along the optic nerve, and turns sensation into a conscious experience of the world. It is important to note that sensation and perception can be quite different. Whereas sensation represents a veridical, albeit limited, representation of the world, our perception is highly influenced by experience and expectations. Once information from the eyes arrives in V1, it causes activity in nerve cells. This process is not random and is in fact highly structured. Neurons in V1 have what are termed receptive fields; they respond to stimuli located only in specific regions of the visual field. They are also sensitive to specific properties of the incoming signal. For example, some cells prefer to respond to lines that are oriented horizontally. As information passes from V1 to other visual areas of the brain, an increasingly complex representation of the viewed object is constructed. There are many such visual areas in the human brain, each devoted to processing specific features of objects. For example, some areas will determine the color of the object, others its spatial location, and still others its motion. At some point, the brain assembles all of this information into an integrated percept of the object, and we are able to identify it, report its location, and/or pick it up. The two-dimensional projection of objects and scenes onto the retina is reconstructed as a three-dimensional perception of the world. This process is an active one; we construct a representation of that object and locate it in the world based upon the incoming information, as well as our prior experiences and expectations. This is the basis for visual illusions, in which our brain is tricked into generating a percept that does not match the actual sensory input.

Finally, *attention* is the process by which we select percepts for further processing. A large amount of visual information is produced when we inspect a scene, and not all of it will be relevant to our current task or goal. Our attentional system allows us to select objects, regions of the visual scene, or even periods of time that match our current goals, and to process that selected information more efficiently, often at the expense of other information that is not immediately relevant. To summarize, sensation refers to the activity generated by the sensory organs as a result of interacting with the external world; perception is the process by which that sensory information is used to construct an internal representation of the external world that in turn can be used to guide action; and attention is the process of selecting information relevant to current action goals for enhanced processing.

Studies of Sensation and Perception in Deaf People

There are many studies that have looked at what is sometimes called low-level vision in deaf people. This research has focused on comparing deaf and hearing performance on tasks that require simple decisions about elementary visual features. The most common approach has been to use psychophysical measures—changing the physical properties of a stimulus and measuring the effect on perception or looking at the way changes in the sensation generated by a stimulus result in changes in perception.

Contrast sensitivity refers to an ability to tell the difference between shades of gray. In Figure 12.1 (A), the black and white lines are clearly distinguishable by most observers. By changing the contrast, it is possible to create stimuli that make it difficult (B) or almost impossible (C) to distinguish between the different lines. Our ability to make these distinctions is important. Figure 12.1 (D) shows a scene in high contrast, whereas in Figure 12.1 (E) the same scene is shown with much lower contrast (or as it might appear to someone with very poor contrast sensitivity); when driving at night, sensitivity to contrast can mean the difference between life and death. Our sensitivity to contrast is influenced by several factors, so typically "contrast-sensitivity functions" are calculated. These functions are charts that show "contrast-sensitivity thresholds" across different properties of the stimulus (such as number of lines, thickness of lines, and location in visual field). The thresholds are calculated by changing the contrast differences in the stimulus based upon the responses of the observer, until the experimenter zeroes in on the amount of contrast the observer needs to achieve a prespecified level of accuracy. In this way, it is easy to compare thresholds (and functions) across individuals. One comprehensive study of contrast sensitivity in deaf and hearing adults reported no differences between the two groups, irrespective of the thickness of the lines, how fast they appeared to move, or where they were located in the visual field.[2] Importantly, most of the deaf observers in this study had genetic causes for their deafness; relatively few were deaf as a result of maternal rubella or

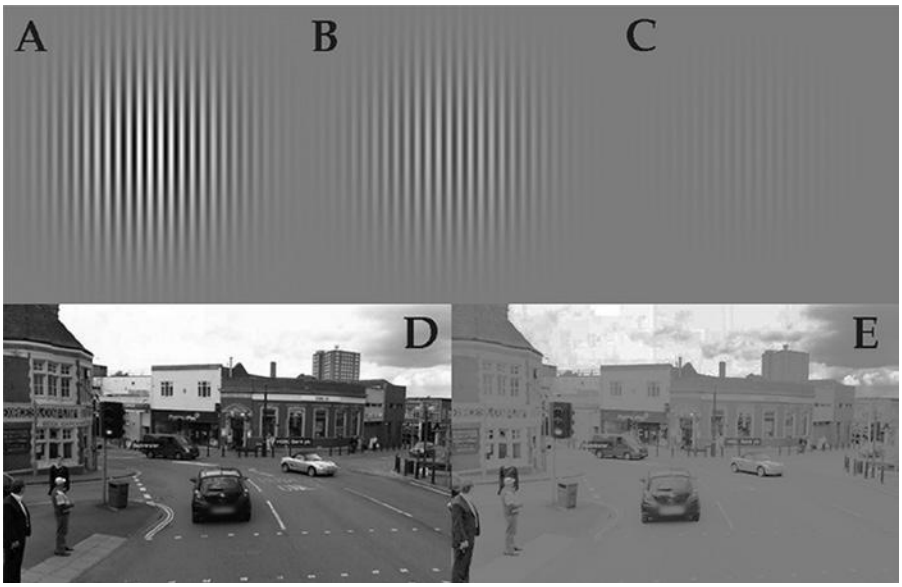


Figure 12.1. Our ability to resolve detail decreases as the amount of contrast in the image decreases. How that ability changes as contrast decreases is a function of other variables, such as spatial frequency (fine or coarse detail). Contrast sensitivity has real-world importance: low contrast sensitivity in noisy and cluttered environments can make it harder to detect important objects and features.

bacterial meningitis—the latter conditions being associated with sensory deficits in vision.[3] Thus, we have no reason to believe that deaf and hearing individuals differ in their sensitivity to contrast.

Another study looked at the ability to discriminate different levels of brightness, by presenting deaf and hearing nine- to twelve-year-olds with pairs of lights and asking them to indicate whether one light is brighter than the other.[4] This study reported that nine- to twelve-year-old deaf children do not differ from hearing peers in their ability to discriminate different levels of brightness. A subsequent study, by Michael Bross and Hannelore Sauerwein, looked at the temporal resolving power of vision in deaf and hearing adults. They presented seventeen- to fifty-nine-year-old deaf and hearing adults with lights that could flicker on and off with different frequencies. At very high frequencies, the lights appeared steady, but as frequency was reduced, it generated the perception of a flickering light. Bross and Sauerwein measured the point at which a steady light appeared to start flickering, called the "critical flicker fusion (CFF) threshold." For both deaf and hearing adults, the CFF thresholds were around 50 Hz, and the two groups were not significantly different.[5] This finding was particularly interesting because an earlier sensory-deprivation study had demonstrated that one week of auditory deprivation in a soundproofed chamber was sufficient to improve CFF thresholds in

hearing adults.[6] This suggests that the visual changes brought about by short-term, temporary deafness cannot be generalized to the case of adults born deaf.

There have been other studies of sensation and perception in deaf individuals, and all come to the same conclusion: deafness does not change low-level vision. Deaf people process visual sensory information in the same way that hearing people do, and use that information to create visual percepts in similar ways, too. Where visual-processing differences in deaf people have been observed, they have been in the visual attention system.

Paying Attention

The amount of information that our sensory systems pass along to the human brain for processing is immense. Furthermore, most of that sensory information is not going to be relevant to the task at hand. As I type these words, the movement of trees outside my window in the breeze is not important to me. Rather, my focus is on the letters appearing on the screen in front of me and assessing whether those words accurately reflect the thoughts I wish to convey and are comprehensible to the naive reader. If I decide to walk outside to pick up a coffee, then the movement of the trees will tell me about current weather conditions and at that point becomes relevant. Our attentional systems allow us to focus on task-relevant information and to ignore or suppress information that distracts us from the task at hand. In fact, we have multiple attentional systems that allow us to do these things in different ways.

In addition to helping us process task-relevant information, attention also allows us to combine information from the different sensory modalities. Although we sometimes think of our sensory systems as independent, they are actually tightly integrated. One example is the "sound-induced flash illusion."[7] In this illusion, a single object flashed once onto a screen can be made to seem like it flashes twice by pairing it with two beeps.[8] For hearing people, our visual and auditory experiences of the world are normally tightly coupled. Thus, when we hear two beeps, our brains interpret the incoming visual input as being two distinct (visual) events. In our everyday conscious experience of the world, such illusory perceptions are rare. Our attentional systems successfully integrate information from different sensory modalities into a stable and coherent perception of the world around us. This allows us to successfully navigate through and act upon our world.

For most individuals, such integration involves all five of the sensory systems. But for those born without one or more senses, the world is experienced in an atypical manner. Deaf people, for example, have a highly restricted experience of the sounds in the world around them. As we shall see later, this can result in brain changes that allow deaf people to process the information available to them in different ways, which also facilitate successful interaction with the world. One consequence is that deaf people are susceptible to different illusions, for example,

a "touch-induced flash illusion," where a double puff of air to the face can give a misleading perception of a visual object flashing twice (when it in fact flashes only once).[9]

What Is Attention?

The philosopher and psychologist William James famously stated, "Everyone knows what attention is. It is the taking possession by the mind in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought. . . . It implies withdrawal from some things in order to deal effectively with others, and is a condition which has a real opposite in the confused, dazed, scatterbrained state."[10] The definition is a good one and has stood the test of time and 120 years of scientific research. However, it is important to note that in fact it contains several definitions of what we now know to be separate attentional systems, albeit systems that are coordinated and work together.

The first point to note is that where we attend does not always correspond to where we are looking! It is possible to look at one thing while our attention is covertly drawn to something else. We often refer to this as "looking out of the corner of the eye." The way in which we shift our attention away from the locus of our eye gaze is called "endogenous orienting." This contrasts with the way in which something appearing in our peripheral vision pulls our attention, usually followed by a shift in eye gaze toward the intruding object. This is termed "exogenous orienting." Other types of attention include maintaining focus and not allowing one's mind to drift, often referred to as "alerting" or "vigilance," and the ability to ignore task-irrelevant information and attend to objects or events that are important for the task at hand, commonly called "executive attention" or "visual selective attention."

One major impact that attention has on sensory and perceptual processing is that it can improve performance at attended locations. Objects or regions of space that are attended are typically processed more efficiently and faster than those that are unattended. Indeed, unless we allocate our attentional resources to an object or region of space, research has shown that we sometimes fail to detect or report seemingly obvious visual events, a phenomenon referred to as "inattentional blindness." Perhaps the most famous example of this was reported by Daniel Simons and Christopher Chabris, who showed that observers could miss a man in a gorilla suit walking through a crowd if their attention was directed toward something else in the same scene.[11] Attention, then, is a critical component to information processing in the real world, and several studies have explored how deafness may result in changes to visual attention.

Visual Orienting and Deafness

One of the most common approaches to studying exogenous orienting of attention is the Posner cuing paradigm (see Figure 12.2).[12] This approach requires observers

to respond to a target presented away from the location they are looking at (usually a small fixation cross). This target can appear at one of a number of locations, and a "cue" prior to the target is used to provide information to the observer about where it might appear. These cues can be valid (appearing at the location of the target), invalid (appearing at an incorrect location), or neutral (appearing at all possible locations and providing no location information at all). Usually the timing is so fast that observers do not have time to move their eyes. However, covert attention can move fast enough to arrive at the cued location before the target appears, with valid cues pulling attention toward the target location and invalid cues pulling attention away from that location. Usually, the experimenter will measure the time it takes for the observer to indicate that the target has appeared (*detection*) or to decide the identity of the target (*discrimination*). A common discrimination judgment might be the direction of an arrow or the identity of a letter. Reaction times (and sometimes accuracy) on trials with valid cues are compared with neutral trials to determine the *benefit* of an attention-orienting cue. Invalid versus neutral cue trials are compared in order to determine the *cost* of attention being oriented away from the actual target location.

Perhaps the earliest study to examine exogenous orienting in deaf people was conducted by Ila Parasnis and Vince Samar in the 1980s.[13] They reported that deaf subjects received the same amount of benefit from a valid cue as hearing controls

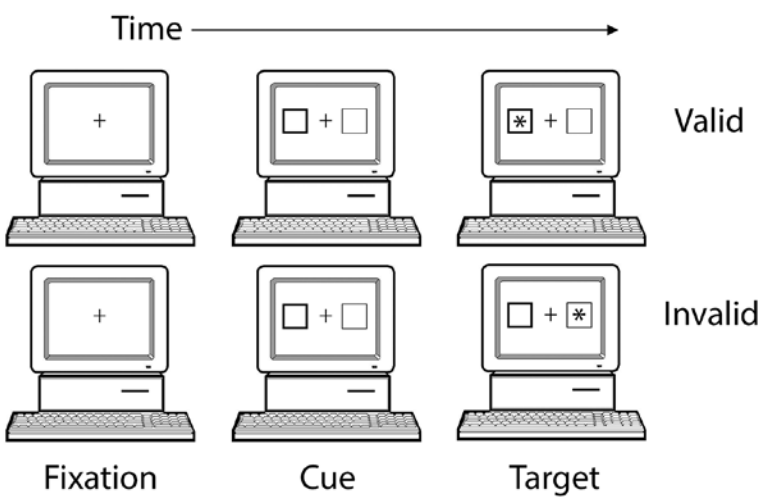


Figure 12.2. Exogenous orienting studies required observers to keep their eye gaze on a fixation cross and then make a decision about a quickly presented target stimulus located elsewhere. A cue presented before that target stimulus can be used to "pull" the observer's attention to the location of the target stimulus (a valid cue); to another location (an invalid cue); or to both locations (a neutral cue, not shown here). By comparing response times and accuracy, the experimenter can calculate the benefit of a valid orienting cue and the cost of an invalid orienting cue.

but that they suffered smaller costs from an invalid cue (in the presence of irrelevant foveal information only). Parasnis and Samar argued that this reflected a heightened ability in deaf individuals to disengage attention from an invalidly cued location, especially when foveal information was competing for that attention. In a motion-discrimination task that also employed valid and invalid cues, Rain Bosworth and Karen Dobkins reported that deaf subjects showed less benefit from a valid cue than did hearing subjects, but this was dependent upon the time interval between the cue and the target appearing (called the "stimulus onset asynchrony," or SOA).[14] The effect was observed at a long SOA of 600 milliseconds but not observed at a short SOA of 200 milliseconds. Another study tested deaf late learners of Spanish Sign Language (with deafness due mostly to ear infection, meningitis, and/or maternal rubella). José María Colmenero and colleagues employed a target-detection task with two possible target locations (twenty degrees to the left or right of fixation), three types of cue (valid, invalid, and neutral), and SOAs ranging from 125 to 250 milliseconds. They reported that the deaf participants were faster than the hearing controls regardless of SOA or cue validity. In addition, deaf participants showed no benefits from a valid cue (replicating the finding of Bosworth and Dobkins) and lower costs with invalid cues (similar to the finding reported by Parasnis and Samar). Colmenero and colleagues argued that deaf subjects possibly shifted their attention to the cue location and then back to fixation before target onset, as attentional orienting operated more quickly in deaf participants than in the hearing controls.[15] Matthew Dye, Dara Baril, and Daphne Bavelier conducted a study of Deaf native signers and hearing controls using the Attentional Network Test (ANT). The ANT also uses cues to measure the efficacy of attentional orienting. Dye, Baril, and Bavelier reported no differences between deaf and hearing subjects in the benefit obtained from a valid orienting cue presented 500 milliseconds prior to target onset, replicating this null effect in a second experiment reported in the same paper (also replicating the findings of Parasnis and Samar).[16] Data obtained using variants of the Posner cuing paradigm therefore paint a somewhat mixed picture. With short SOAs, it seems that deaf adults show less of a cost when cues are invalid. However, benefits obtained from valid cues appear elusive across a range of SOAs, populations, and variants of the paradigm.

More recently, work in Italy has used a change-blindness paradigm to examine attentional orienting in deaf observers. In Davide Bottari, Massimo Turatto, and colleagues' paradigm, subjects were required to detect possible changes in a visual display. Visual displays were presented twice (with or without a change in the second presentation) with a brief gray screen in between presentations designed to remove any exogenous orienting cues to the location of a change. Bottari, Turatto, and colleagues used this task to examine "endogenous orienting," the ability to allocate attention to the visual display as a function of task instructions rather than a salient change in the visual display itself. They tested deaf adult subjects

(a mixture of Deaf nonnative signers and oral deaf adults), deaf adults who had received a cochlear implant (on average within the two years prior to testing), and hearing controls. In a focused condition, subjects were instructed to look for changes in objects in the display appearing at either 3 or 8 degrees of visual angle; in a distributed condition, subjects were not told where the change was going to occur. This was a difficult task, and when eight objects were present in the display (four at 3 degrees and four at 8 degrees), performance was too poor to avoid floor effects. However, when only four objects were present (two at each eccentricity), the authors reported that deaf subjects were better than hearing controls and deaf subjects with cochlear implants at detecting a change at 3 degrees, but worse at 8 degrees.[17] In a subsequent study using a more traditional cuing paradigm, Bottari, Elena Nava, and colleagues displayed transient targets at 3 or 8 degrees of visual angle to deaf and hearing adults in eight possible locations. The subjects were required to either detect the target onset or discriminate the identity of the target (a circle with an opening on the left or on the right). They reported that deaf subjects were faster than hearing subjects at detecting target onsets at 3 and 8 degrees but that the two groups did not differ in their ability to discriminate.[18] This suggests a similar time course for attentional orienting in the two groups (required for target discrimination) but enhanced ability to detect a target in the visual periphery (3 to 8 degrees) in adult Deaf signers (some who were native signers and some who acquired a sign language later in life). Reconciling differences in findings is difficult, given the differences in the deaf samples recruited for these two studies.

Despite a relatively large number of studies, it is still unclear what the effects of deafness are on exogenous orienting. Visual exogenous orienting is an ability that one might predict to be enhanced in deaf individuals, especially as it is a function normally supported by the auditory modality and thus one that might be susceptible to the influence of cross-modal plasticity.[19] However, studies have used a range of experimental paradigms each with different deaf populations, and this makes it difficult for a clear picture to emerge.

Spatial Distribution of Attention

For hearing individuals, it is intuitive to think that most of our attention is centered on the object we are looking at. This is, in some sense, a default spatial allocation of our visual attention when we are vigilant (and not daydreaming or otherwise mentally "absent") and have no reason to anticipate a goal-relevant event in our peripheral visual field. The situation might be quite different for a quarterback preparing to throw a football. Not only must he scan the visual field for an open receiver, but he must also be aware of potential onrushing defensive linemen coming at him from the side. As we shall see, some researchers have proposed that deaf people have a default "quarterback mode" when allocating their visual attention.

One of the first studies of how deaf people attend to their visual fields was

reported by Wing Loke and Shareen Song in 1991. In their study, deaf and hearing adults were required to detect the onset of visual targets located at either 0.5 or 25 degrees of visual angle from fixation. There were no cues, and the observers did not know where the targets were going to appear. Thus, the optimal strategy for the observers was to spread their attention (endogenously) across the visual field and monitor all possible locations. Loke and Song reported faster response times for deaf subjects than for hearing subjects when targets were presented at peripheral locations. At central locations, the deaf subjects were also faster, but the effect did not reach statistical significance.[20] Other studies examining the spatial allocation of attention have typically presented a target that is accompanied by distracting information, sometimes referred to as a "flanker." Flankers can be designed to help task performance (for example, by being mapped to the same response as the target) or to hinder it (by being mapped onto a response that competes with that of a target). The first study to use flankers with Deaf native signers was reported by Jason Proksch and Daphne Bavelier in 2002. They used a shape-discrimination task (is the target a square or a diamond?) and manipulated the location of a response-competing flanker, placing it either in central vision—0.05 degrees of visual angle—or in peripheral vision—4.2 degrees of visual angle. Proksch and Bavelier computed a "compatibility effect" to measure the effect of these response-competing flankers at the central and peripheral locations. As expected, centrally located flankers, those placed very close to fixation, had a greater impact on the performance of hearing adults than peripheral flankers did. However, for Deaf native signers the effect was reversed: peripheral flankers had a greater impact than central flankers. The authors proposed that the deaf observers allocated more of their visual attention at 4.2 degrees than they did at 0.05 degrees, with the reverse being true for hearing observers. The pattern of results observed with hearing native signers was just like that of hearing adults who did not sign, suggesting that this was an effect of deafness and not sign language. Thus, the authors' interpretation was not one of differences in distractibility. Rather, Proksch and Bavelier proposed that the task-irrelevant flankers influenced both deaf and hearing individuals, with differences in performance due to a redistribution of attentional resources to the periphery in deaf individuals.[21] In contrast, a recent study used a similar approach, comparing the effect of response-competing "face" and "object" flankers at central (0.0-degree) and peripheral (4.4-degree) locations. Nadine Hauthal, Markus F. Neumann, and Stefan R. Schweinberger reported similar compatibility effects for hearing and Deaf native signing adults irrespective of the spatial location of the flankers, suggesting that the effects may not generalize across different types of stimuli.[22]

A study by Douglas Sladen and colleagues examined the effect of flankers located at 1 degree of visual angle using an Eriksen flanker paradigm.[23] This paradigm requires an observer to make a response to a target that is flanked (usually to the left and right) by stimuli designed to elicit another response. For example,

Sladen and colleagues used letter strings such as HHNHH or NNHNN, where the observer was required to indicate the identity of the central letter. They reported greater interference from flankers for deaf adults who used ASL as a primary means of communication (acquisition history was not reported), who were also slower to respond correctly to the centrally presented targets.[24] Dye, Baril, and Bavelier reported a similar study, but they used nonalphanumeric stimuli, replacing the letters with arrows pointing to the left or to the right. They also reported that Deaf native signing adults were more influenced by flanking arrows (up to 3 degrees of visual angle) than hearing native signers were, and when there were no flankers present, the Deaf signers were no faster or slower to respond than hearing observers.[25] In these flanker studies, the focus is on the influence of information that is not task-relevant. The flankers are usually visual objects that do not need to be processed in order to complete the task. The fact that the flankers have an influence suggests that, in some sense, the observers cannot help but process them. Other studies have used peripheral targets—as in the study conducted by Loke and Song—to compare deaf and hearing people on processing goal-related information in the visual periphery. Some of these studies have used "kinetic perimetry" to measure the extent of the visual field in deaf and hearing adults. In these studies, an observer fixates on a central point and then makes a response when a peripheral target is detected. The target starts outside of the field of view and is slowly moved toward the central location until a detection response is made. The observer does not know when the target will appear, nor from which direction. In this sense, the kinetic-perimetry task is an attentional task. If deaf observers are better able to distribute their attentional resources to the periphery than are hearing observers, one would predict an ability to detect the targets at more distal locations in the visual field; the allocation of attention would take a subthreshold target to suprathreshold status. This has indeed been reported by researchers using different approaches to kinetic perimetry.[26]

A recent study reported by Matthew Dye, Peter Hauser, and Daphne Bavelier administered a variant of the Useful Field of View (UFOV) test to Deaf native signers and hearing adults. The UFOV is a visual test designed by Karlene Ball and others that measures the size of the visual field, from which useful information can be extracted.[27] Clearly, "useful" is a criterion that is task-dependent. In Dye, Hauser, and Bavelier's version of the UFOV, observers were required to identify a stimulus presented centrally at fixation (a small face with short or long hair) and then to indicate the location of a concurrently presented peripheral target (a star) embedded within a field of distractors (squares). The eccentricity of the target was held constant (20 degrees of visual angle), and its location varied from trial to trial. Using an "adaptive-staircase procedure," the researchers measured the length of time the observers needed the stimuli to be displayed in order to be correct around 79 percent of the time. They found that Deaf native signers needed less time than hearing nonsigners to select and report the location of a peripheral

target embedded in a field of distractor shapes while at the same time correctly identifying the central target. This superiority was also observed in deaf orally educated adults who knew very little sign language, but not observed in hearing native signers. This suggested that a period of significant deafness was sufficient to promote heightened attention to the visual periphery, with use of a sign language having a much smaller effect (an instance of Deaf Gain independent of Sign Gain; see Peter Hauser and Geo Kartheiser, this volume). A cross-sectional study of Deaf and hearing children seven to seventeen years of age in the same report revealed that seven- to ten-year-old hearing children performed as well as hearing adults; that is, by the age of seven years, the ability to attend to the visual periphery was fully developed in the hearing. In contrast, the superiority of deaf over hearing observers increased across the age range tested.[28] A subsequent study by Charlotte Codina and colleagues asked five- to fifteen-year-old deaf and hearing children and deaf and hearing adults to fixate on a central target and report the locations of flashed LEDs of varying intensity located in the far visual periphery (between 30 and 85 degrees of visual angle from fixation). They reported that adolescent deaf children (thirteen to fifteen years) and deaf adults (eighteen to forty-seven years) outperformed their hearing peers, responding more quickly to the peripherally presented LEDs.[29] Thus, the developmental trend observed by Codina and colleagues closely mirrored that reported by Dye, Hauser, and Bavelier using the Useful Field of View task. Taken together, these studies suggest that several years of severe to profound deafness might be necessary before behavioral changes become apparent, and that the brain changes underlying increased peripheral visual attention in the deaf may be continuing to occur throughout middle childhood and adolescence.

Despite large differences in recruitment, and experimental procedures, there are some common findings across all of these studies of visual processing in deaf people. First, deaf–hearing differences are most likely to be observed under what Francesco Pavani and Davide Bottari have termed "distributed attention."[30] Tasks that require observers to focus their attention upon the location of a target (such as the majority of low-level-vision tasks used to measure sensory thresholds) do not reveal different visual abilities in deaf people. Those differences are more common when attention must be spread across both central and peripheral locations. Second, deaf–hearing differences are most apparent when processing stimuli in the peripheral visual field (studies report positive effects at eccentricities ranging from 3 to 85 degrees of visual angle) and in tasks involving visual motion. This observation—that changes are observed in peripheral vision and in motion processing—led Helen Neville and Donald Lawson to propose that the dorsal visual pathway (the "where" pathway, or "vision for action" pathway) is most susceptible to plastic changes in individuals born with severe to profound deafness.[31] Third, the results of studies of exogenous visual orienting in deaf people are mixed.

It has been suggested that the data can be accounted for by very rapid exogenous orienting in deaf individuals.[32] However, at present there is little consistent evidence that deaf individuals are any better than hearing individuals at orienting their attention in response to an exogenous visual cue.

The Deaf Brain

These changes in visual function are associated with changes in the brains of deaf individuals. Indeed, the study of the neural systems of profoundly deaf people has informed our understanding of how the human brain integrates information from the different sensory modalities—an example of Deaf Gain benefiting society at large. We are becoming increasingly aware that the brain is a multisensory processor; although textbooks may talk about sensory systems in the brain as being unimodal, devoted to the processing of stimuli in just one modality, we now know that information from the different modalities is integrated at very early stages of processing and that information from one modality exerts significant influence on low-level processing in other modalities.[33] This is the basis for cross-modal illusions such as the sound-induced flash illusion (discussed earlier) and the "McGurk effect," where lip movements bias the auditory perception of speech.[34]

When visual information is processed in the brain, information about the form and color of an object is initially separated from information about where that object is located and how it is moving. The former processing pathway is referred to as the ventral visual ("what") pathway, whereas the latter is the dorsal visual ("where") pathway. The dorsal-route hypothesis proposes that alterations in the dorsal visual pathway of deaf individuals result in a redistribution of attention across the visual field, enhancing the processing of visual-motion stimuli and/or visual stimuli presented in the periphery.[35] Evidence for changes in the dorsal pathway have been obtained using event-related-potential (ERP) and functional-magnetic-resonance-imaging (fMRI) techniques. ERP measures the electrical activity on the scalp that is produced by neural activity.[36] Different visual events and neural processes result in different patterns of electrical activity. Measuring how the activity varies in response to different tasks or stimuli allows researchers to draw inferences about brain function. Functional MRI measures changes in the deoxygenation of blood in order to draw inferences about which areas of the brain are active while performing a particular task.[37]

In a series of ERP experiments reported by Helen Neville and Donald Lawson, hearing and Deaf subjects were instructed to attend to central or peripheral locations and indicate the direction of apparent motion of a sequence of target squares presented at those locations on 20 percent of trials (the other 80 percent of trials consisted of a single "standard" square with no apparent motion). They reported that the size and timing of some patterns of electrical activity were similar for deaf and hearing subjects, as were the effects of attention on that activity.[38] However,

for a pattern of activity related to attentional processing, Neville and Lawson reported a larger and different pattern of activity for deaf subjects when actively attending to the visual stimulus. They interpreted their data as suggesting that early, profound deafness resulted in changes to the neural structures supporting spatial attention and motion processing.[39]

Daphne Bavelier and colleagues reported an fMRI study that required attention to fields of moving dots in the central or peripheral visual field. Deaf native signers showed more activation in area hMT+—a visual area known to be involved in motion processing—when they attended to motion in the periphery compared to the center of a visual display. The reverse pattern was observed for hearing adults (both signers and nonsigners). In addition, Bavelier and colleagues reported more brain activation in the posterior parietal cortex and the posterior superior temporal sulcus of deaf subjects compared to hearing subjects.[40] These are brain areas known to be involved in the integration of sensory information from multiple modalities and in attentional processing.[41] Volumetric measurement of early visual cortex has not reported size differences between deaf and hearing subjects,[42] reinforcing the view that deaf people have enhanced visual attention abilities but not superior vision per se.

Deaf Gain and the Eye of the Beholder

Having reviewed some of the literature on deafness and vision, as well as associated brain changes, can we then conclude that this is an example of Deaf Gain? For a deaf person, there are clearly benefits that accrue because of enhanced peripheral attention. It can be interpreted as an ecologically adaptive compensation. Hearing individuals typically monitor their peripheral environment with their auditory system, but this approach is not available to deaf people. An enhanced peripheral visual attention system therefore takes on the function of the absent auditory system. Although this does not allow deaf people to see what is happening behind them, when combined with strategic decisions about seating, head movement, and so forth, it does allow excellent visual monitoring of the environment. We do not yet know whether this benefit extends to a decrease in driving accidents (or, at least, a decrease in accidents due to unexpected events that start in the visual periphery) or better-than-expected performance in sports where peripheral visual attention is at a premium.

Although from a Deaf perspective this can be viewed as Deaf Gain, from a medical or rehabilitative perspective it is seen as the opposite. For those who favor cochlear implantation and the aural-oral rehabilitation of deaf children, such compensatory changes are the hallmark of deficit. Several studies have suggested that deafness results in a cross-modal "takeover" of auditory cortical regions.[43] Furthermore, some studies have reported that this cross-modal recruitment of auditory areas by visual processing in deaf individuals is predictive of listening and

spoken-language outcomes following cochlear implantation; the greater the use of auditory areas for vision, the less benefit is obtained from a cochlear implant.[44] From this normalizing perspective, therefore, Deaf Gain is another indicator of hearing loss.

Unanswered Questions

There is still much that we do not know about the effects of deafness on visual development. Very little work has been conducted with deaf children, and it is as yet unclear how early changes in visual processing might occur. It is also not known whether the compensatory benefits observed in adults would extend to children, or whether an altered visual attention system might be disruptive. This may particularly be true in educational situations where learning environments, educators, and ASL–English interpreters do not take such compensatory changes into account. More research is also required to determine whether the findings reviewed here generalize beyond Deaf native signers. Although some studies have included other deaf populations, the large amount of variability in those populations means that scientists conducting basic research have not extensively studied them. In the context of cochlear implantation, we do not know the visual implications of early implantation on individuals who later reject their use. Do they become deaf adults with uncompensated visual attention systems? Are there consequences for their interactions with the world? Finally, the cross-modal neuroplasticity associated with changes in visual processing in deaf people has been linked to poor spoken-language outcomes following cochlear implantation. However, we know very little about the effect of early sign-language exposure on such outcomes—positive or negative—and about the predictive power of cross-modal plasticity in individuals who have experienced such early exposure to sign language. These studies will not be easy to conduct, but one intriguing possibility is that they will reveal how Deaf Gain and Sign Gain can work together to promote healthy cognitive, linguistic, and social-cultural development in deaf children.

Notes

1. Randal C. Archibold, "Deaf Officers Step in Where Police Work Counts on Eyes More Than Ears," *New York Times,* December 18, 2010, http://www.nytimes.com/2012/12/19/world/americas/deaf-officers-keep-watch-over-crime-in-oaxaca.html.
2. Eva M. Finney and Karen R. Dobkins, "Visual Contrast Sensitivity in Deaf versus Hearing Populations: Exploring the Perceptual Consequences of Auditory Deprivation and Experience with a Visual Language," *Cognitive Brain Research* 11 (2001): 171–83.
3. James F. Bale, "Fetal Infections and Brain Development," *Clinical Perinatology* 36 (2009): 639–53; Larry J. Baraff, Sidney I. Lee, and David L. Schriger, "Outcomes of Bacterial Meningitis in Children: A Meta-analysis," *Pediatric Infection Disease Journal* 12 (1993): 389–94.
4. Michael Bross, "Residual Sensory Capacities of the Deaf: A Signal Detection Analysis of a Visual Discrimination Task," *Perceptual and Motor Skills* 48 (1979): 187–94.

5. Michael Bross and Hannelore Sauerwein, "Signal Detection Analysis of Visual Flicker in Deaf and Hearing Individuals," *Perceptual and Motor Skills* 51 (1980): 839–43.
6. Michael Bross and John P. Zubek, "Effect of Auditory Deprivation on Visual Resolving Power," *Canadian Journal of Psychology* 29 (1975): 340–47.
7. Ladan Shams, Yukiyasu Kamitani, and Shinsuke Shimojo, "What You See Is What You Hear," *Nature* 408 (2000): 788.
8. "Sound-Induced Flash Illusion: Quicktime Demo," Visual and Multisensory Perception Lab, UCLA, accessed March 30, 2013, http://shamslab.psych.ucla.edu/demos/.
9. Christina M. Karns, Mark W. Dow, and Helen J. Neville, "Altered Cross-Modal Processing in the Primary Auditory Cortex of Congenitally Deaf Adults: A Visual-Somatosensory fMRI Study with a Double-Flash Illusion," *Journal of Neuroscience* 32 (2012): 9626–38.
10. William James, *The Principles of Psychology* (New York: Holt, 1890), 403.
11. Daniel J. Simons and Christopher F. Chabris, "Gorillas in Our Midst: Sustained Inattentional Blindness for Dynamic Events," *Perception* 28 (1999): 1059–74; "Selective Attention Test," YouTube, accessed March 30, 2013, http://www.youtube.com/watch?v=vJG698U2Mvo.
12. Michael I. Posner, "Orienting of Attention," *Quarterly Journal of Experimental Psychology* 32 (1980): 3–25.
13. Ila Parasnis and Vince J. Samar, "Parafoveal Attention in Congenitally Deaf and Hearing Young Adults," *Brain and Cognition* 4 (1985): 313–27.
14. Rain G. Bosworth and Karen R. Dobkins, "The Effects of Spatial Attention on Motion Processing in Deaf Signers, Hearing Signers, and Hearing Nonsigners," *Brain and Cognition* 49 (2002): 152–69.
15. José María Colmenero et al., "Mechanisms of Visuospatial Orienting in Deafness," *European Journal of Cognitive Psychology* 16 (2004): 791–805.
16. Matthew W. G. Dye, Dara E. Baril, and Daphne Bavelier, "Which Aspects of Visual Attention Are Changed by Deafness? The Case of the Attentional Network Test," *Neuropsychologia* 45 (2007): 1801–11.
17. Davide Bottari, Massimo Turatto, et al., "Change Blindness in Profoundly Deaf Individuals and Cochlear Implant Recipients," *Brain Research* 1242 (2008): 209–18. A "degree of visual angle" is a metric referenced to the observer's retina. For eccentricity, larger values correspond to locations further into the periphery of the observer's visual field.
18. Davide Bottari, Elena Nava, et al., "Enhanced Reactivity to Visual Stimuli in Deaf Individuals," *Restorative Neurology and Neuroscience* 28 (2010): 167–79.
19. Daphne Bavelier and Helen J. Neville, "Cross-Modal Plasticity: Where and How?," *Nature Reviews Neuroscience* 3 (2002): 443–52.
20. Wing H. Loke and Shareen Song, "Central and Peripheral Visual Processing in Hearing and Nonhearing Individuals," *Bulletin of the Psychonomic Society* 29 (1991): 437–40.
21. Jason Proksch and Daphne Bavelier, "Changes in the Spatial Distribution of Visual Attention after Early Deafness," *Journal of Cognitive Neuroscience* 14 (2002): 687–701.
22. Nadine Hauthal, Markus F. Neumann, and Stefan R. Schweinberger, "Attentional Spread in Deaf and Hearing Participants: Face and Object Distractor Processing under Perceptual Load," *Attention, Perception, and Psychophysics* 74 (2012): 1312–20.
23. Barbara A. Eriksen and Charles W. Eriksen, "Effects of Noise Letters upon the Identification of a Target Letter in a Nonsearch Task," *Perception and Psychophysics* 16 (1974): 143–49.
24. Douglas P. Sladen et al., "Visual Attention in Deaf and Normal Hearing Adults: Effects of Stimulus Compatibility," *Journal of Speech, Language, and Hearing Research* 48 (2005): 1529–37.
25. Dye, Baril, and Bavelier, "Which Aspects of Visual Attention Are Changed by Deafness?"
26. Courtney Stevens and Helen J. Neville, "Neuroplasticity as a Double-Edged Sword: Deaf Enhancements and Dyslexic Deficits in Motion Processing," *Journal of Cognitive Neurosci-*

ence 18 (2006): 701–14; David C. Buckley et al., "Action Video Game Players and Deaf Observers Have Larger Goldmann Visual Fields," *Vision Research* 50 (2010): 548–56.

27. Karlene K. Ball et al., "Age and Visual Search: Expanding the Useful Field of View," *Journal of the Optical Society of America A* 5 (1988): 2210–19.
28. Matthew W. G. Dye, Peter C. Hauser, and Daphne Bavelier, "Is Visual Attention in Deaf Individuals Enhanced or Deficient? The Case of the Useful Field of View," *PLOS One* 4 (2009): e5640, doi:10.1371/journal.pone.0005640.
29. Charlotte Codina et al., "Deaf and Hearing Children: A Comparison of Peripheral Vision Development," *Developmental Science* 14 (2011): 725–37.
30. Francesco Pavani and Davide Bottari, "Visual Abilities in Individuals with Profound Deafness: A Critical Review," in *The Neural Bases of Multisensory Processes,* ed. Micah M. Murray and Mark T. Wallace (Boca Raton, Fla.: CRC Press, 2012), 423–48.
31. Helen J. Neville and Donald Lawson, "Attention to Central and Peripheral Visual Space in a Movement Detection Task: An Event-Related Potential and Behavioral Study, II; Congenitally Deaf Adults," *Brain Research* 405 (1987): 268–83.
32. Colmenero et al., "Mechanisms of Visuospatial Orienting in Deafness."
33. Arnaud Falchier et al., "Anatomical Evidence of Multimodal Integration in Primate Striate Cortex," *Journal of Neuroscience* 22 (2002): 5749–59; Asif A. Ghazanfar and Charles E. Schroeder, "Is Neocortex Essentially Multisensory?," *Trends in Cognitive Neuroscience* 10 (2006): 278–85.
34. Harry McGurk and John McDonald, "Hearing Lips and Seeing Voices," *Nature* 264 (1976): 746–48.
35. Helen J. Neville, "Intermodal Competition and Compensation in Development: Evidence from Studies of the Visual System in Congenitally Deaf Adults," *Annals of the New York Academy of Sciences* 608 (1990): 71–91.
36. See Steven A. Hillyard, "Event-Related Potentials and Selective Attention," in *Cognitive Psychophysiology: Event-Related Potentials and the Study of Cognition,* ed. Emanuel Donchin (Hillsdale, N.J.: Erlbaum, 1984), 51–72, for an introduction to the technique and its application in the study of cognition.
37. See Nikos K. Logothetis, "What We Can Do and What We Cannot Do with fMRI," *Nature* 453 (2008): 869–78, for a recent review of fMRI and the neuroimaging of human cognition.
38. Helen J. Neville and Donald Lawson, "Attention to Central and Peripheral Visual Space in a Movement Detection Task: An Event-Related Potential and Behavioral Study, I; Normal Hearing Adults," *Brain Research* 405 (1987): 253–67; Neville and Lawson, "Attention to Central and Peripheral Visual Space in a Movement Detection Task: An Event-Related Potential and Behavioral Study, II; Congenitally Deaf Adults."
39. Helen J. Neville and Donald Lawson, "Attention to Central and Peripheral Visual Space in a Movement Detection Task, III; Separate Effects of Auditory Deprivation and Acquisition of a Visual Language," *Brain Research* 405 (1987): 284–94.
40. Daphne Bavelier et al., "Visual Attention to the Periphery Is Enhanced in Congenitally Deaf Individuals," *Journal of Neuroscience* 20 (2000): RC93, 1–6.
41. For more discussion of studies reporting brain changes as a result of deafness, see Daphne Bavelier, Matthew W. G. Dye, and Peter C. Hauser, "Do Deaf Individuals See Better?," *Trends in Cognitive Sciences* 10 (2006): 512–18.
42. Ione Fine et al., "Comparing the Effects of Auditory Deprivation and Sign Language within the Auditory and Visual Cortex," *Journal of Cognitive Neuroscience* 17 (2005): 1621–37.
43. Ibid.; Sari Levänen, Veikko Jousmäki, and Riitta Hari, "Vibration-Induced Auditory-Cortex Activation in a Congenitally Deaf Adult," *Current Biology* 8 (1998): 869–72; Nicole Lambertz et al., "Cross-Modal Plasticity in Deaf Subjects Dependent on the Extent of Hearing Loss," *Cognitive Brain Research* 25 (2005): 884–90; Eva M. Finney, Ione Fine, and

Karen R. Dobkins, "Visual Stimuli Activate Auditory Cortex in the Deaf," *Nature Neuroscience* 4 (2001): 1171–73.

44. Anne-Lise Giraud and Hyo-Jeong Lee, "Predicting Cochlear Implant Outcome from Brain Organisation in the Deaf," *Restorative Neurology and Neuroscience* 25 (2007): 381–90; Kristi A. Buckley and Emily A. Tobey, "Cross-Modal Plasticity and Speech Perception in Pre- and Postlingually Deaf Cochlear Implant Users," *Ear and Hearing* 32 (2011): 2–15; Hyo-Jeong Lee et al., "Cortical Activity at Rest Predicts Cochlear Implantation Outcome," *Cerebral Cortex* 17 (2007): 909–17.

13

A MAGIC TOUCH

Deaf Gain and the Benefits of Tactile Sensation

DONNA JO NAPOLI

In this chapter I argue that tactile senses are important in many ways. They play a role in communication, in physical development, and in the formation of a healthy psychosocial self. Tactile senses contribute to our overall cognitive awareness and intelligence, and they are now used in a variety of career paths, including teaching, medicine, and creating virtual-reality telecommunication systems, to name a few. So, strong tactile sensitivity is of great benefit to the individual.

This fact matters in a volume on Deaf Gain. When a particular sense is absent, changes in the brain allow better use of those senses that are present. This plasticity of the brain is responsible for the advantages in visual acuity that deaf people have over hearing people—as Matthew Dye (in this volume) has documented. But this plasticity has also resulted in acute tactile sensitivity among deaf people. The role of touch in Deaf culture tends to promote that tactile sensitivity. And the use of a sign language nurtures that sensitivity while employing it to enrich one's cognition in a profound way. In sum, a heightened tactile sense is an important Deaf Gain, physically, psychosocially, cognitively, and professionally.

Please note that touch is a multimodal sense in itself. It covers tactile information via the skin as well as temperature, proprioception (knowledge of one's body position), kinesthesia (knowledge of one's body movement and behavior), and nociception (pain). By *touch*, then, I mean the entire somatosensory system, a complex system that processes information via muscles, bones, organs, blood vessels, the skin, and the epithelia (epithelial tissues line internal body surfaces, form glands, and perform a range of functions beyond the detection of sensation, including secretion, absorption, protection, and transport of materials between cells). In this chapter I will primarily use the terms *touch* and *tactile* to refer to somatosensory activity and experience, because those are the terms used in ordinary talk and in most of the literature cited here.

Touch Communication

Vision is the dominant sensory modality among all higher primates (humans, apes, and monkeys); in this way, higher primates strongly contrast to most other terrestrial mammals, in which the sense of smell is dominant.[1] Although linguistic-based communication (whether oral-aural or manual-visual) dramatically enriches human social cohesion, body language—perceived visually—has been argued to be a principal vehicle of human communication and the one that displays the greatest range of texture and subtlety with respect to the overall message sent.[2]

Close behind vision, however, come our tactile senses, then our auditory senses.[3] Nevertheless, human communication has not used tactile senses anywhere near as extensively as vision, probably for a number of reasons, including how very dominant vision is.[4] Also, tactile communication has many limitations. Tactile communication is possible only when two beings are in close proximity, and tactile information is distorted under very low temperature.[5] Additionally, tactile communication is reliable in that it is difficult to intentionally modify tactile information, but that very reliability means that one cannot conceal or deceive easily, which is a drawback in communication; further, tactile information consists mainly of "symptoms rather than signals," so it allows few degrees of freedom.[6]

Despite these limitations, however, tactile senses are of enormous importance to human communication and to the very experience of being human.[7] Very small children who have not yet uttered an intelligible word will communicate via touch that they know what an object is used for. For example, a nine-month-old might pick up a toy phone and hold it to her ear briefly, or make a quick stirring motion with a spoon, or touch a hairbrush to her hair.[8] These actions happen in passing; they happen not because the child wants to talk on the phone or cook or brush her hair, but just because she wants to acknowledge, through touch, the knowledge that she has. We use touch to confirm our reality our whole life long. Kelly Klein argues that touch is one of the important ways we express and understand our gender; thus, it is critical to identity.[9] And it is special: haptic events (that is, touch events that are voluntarily initiated) within human society involve experience in a unique way in that they are at least partially symmetric. That is, if Raul touches Mateo, Raul has a tactile knowledge of Mateo, but Mateo also has a tactile knowledge of Raul, though the limited nature of the knowledge will be different in each case. Thus, Raul may learn the feel of Mateo's whole arm under his fingertips, whereas Mateo may learn the feel of Raul's fingertips along his whole arm. Vision and hearing are not like this. It is possible for one person to see a second person without being seen and without the second person having any sensation associated with seeing the other or being seen by the other. Likewise, it is possible for one person to hear another without any symmetric relationship occurring. This

is equally true of the two remaining senses, smell and taste (at least insofar as a taste event is not accompanied by a haptic event). A haptic event between people, then, entails an exchange, an interaction in which each participant experiences something.

It's not surprising, then, that many (most?) cultures have rituals that involve haptic exchanges, particularly in greetings or partings. These exchanges range from kisses (which can be heartfelt or merely motions of the lips in the air, perhaps beside the cheek) and handshakes (which can be relatively limp or firm, sometimes involving the forearms, and which can be true shakes or just fist bumps or high fives), familiar in Western societies, to rituals that are more confined to a particular culture or just a few cultures. Nupe men who are well acquainted, for example, stretch out their hands many times successively and touch each other's fingers lightly.[10] Some cultures engage in nose rubbing, or at least did at an earlier point in their history, including the Maori (who also touch foreheads and share breath as part of this ritual) and the Inuit.[11] Many cultures use hugs and shoulder taps or combinations of them, as in Ethiopia.[12] Such rituals are important: "Greeting rituals imply a positive acceptance of the person met, a willingness to establish a social relationship; parting rituals imply a recognition that the relationship has been established and some hint that it could continue."[13] Moreover, doing them incorrectly or in an inappropriate context can be severely offensive—as with the Maori nose rub.[14]

I suspect that one reason such deep offense can be taken from an inappropriate haptic event is the inalienable interactional nature of haptic events. That is, by touching me inappropriately you have given me no choice but to partake of an inappropriate event. Thus, the active participant in the haptic event exercises more power than the passive participant by the very fact that the active participant initiates the event in the given circumstances; thus, the active participant's touch can arouse discomfort to the point of disgust, fear, and the feeling of being molested.[15] In general, the less well we know someone, the more that person's "touch rights" in regard to us are limited to task-oriented ones,[16] and if the person goes beyond that, he or she is in violation of social norms and of our sense of privacy.

Another reason for offense at inappropriate haptic events may be that haptic events elicit the greatest emotional responses when they are on areas of the body other than the hands.[17] In many (most?) cultures, areas other than the hands and arms are more likely to be off limits to strangers and thus targets for inappropriate haptic events. Therefore, a taboo touch results in a strong reaction.

A third reason for offense at inappropriate haptic events may be that we are able to understand to a great extent the emotions of the person who touches us simply via that touch. In a study in which people were touched on the whole body by unacquainted partners, the passive participants were able to decode the emotions of not just anger, fear, disgust, love, gratitude, and sympathy—all emotions that had been shown to be communicated by touch in earlier studies—but also

happiness and sadness, two emotions that had not been previously recorded to be detectable.[18] If someone touches us in an inappropriate way and we detect an emotion that is disagreeable to us, we might well take strong offense.

Conversely, done properly and with sincerity, haptic events can be enormously positive. They can seal a friendship, confirm a love, satisfy sexual needs. Although many supervisors fear using touch in the workplace because of concerns about sexual harassment,[19] in fact a sincere handshake or pat on the back can be very effective in the workplace, particularly in delivering an apology.[20] Certain kinds of touches occurring in situations where the person being touched is in need of comfort or reassurance can be effectively supportive; they can "nurture, reassure or promise protection";[21] "touch is one of the most basic human needs. . . . Research shows that people need touch for physical and psychological health."[22] As the poet Maya Angelou says, "I've learned that every day you should reach out and touch someone. People love a warm hug, or just a friendly pat on the back."[23]

Touch and Infant Development

But touch delivers far more than these easily identifiable emotional and social benefits. The skin is our largest sensory organ and the one that conveys tactile senses, so touch is the first sense to develop in humans[24] and the primary one to deliver stimulation to the fetus.[25] Once an infant is born, touch is the most immediate and most direct connection to the world, and the infant needs it in order to develop properly—physically and emotionally.[26] There have even been cases in which an infant declared dead at birth was held against the mother's bare skin and cuddled and, after hours of this, revived.[27] (This was the case with my own maternal grandmother, who revived after a night of being left for dead against her mother's breast.)

Research conducted at the University of Miami's Touch Research Institute has confirmed the benefit of touch for infants. Preterm neonates are the subject of many of its studies. Those who were massaged three times a day for ten to fifteen minutes averaged a 47 percent weight gain, showed better sleep–awake patterns, were more alert when awake, and showed better motor and range-of-state behavior than the control group, with the result that their hospital stay was six days shorter than that of those who weren't massaged.[28] One reason for this may be that massage affects the vagus nerve, which then stimulates the gastric system to release food-absorption hormones. Likewise, another study of preterm neonates showed that massage with moderate pressure was more beneficial than massage with light pressure with respect to greater weight gain and increase in vagal tone,[29] and still another showed that massage increased vagal activity and gastric motility, both associated with weight gain.[30] A second reason why massage may lead to overall health improvement for preterm infants is that massage increases their levels of those hormones that help the body respond to stress.[31] Repeatedly, preterm neonates who receive massage therapy show fewer stress behaviors than

those who don't receive massage therapy,[32] and connected to lower stress is better feeding behavior. A third reason why massage therapy is so beneficial may be that touch helps infants have better-organized sleep states; this is important because release of the human growth hormone is correlated with that portion of a sleep cycle that shows slow, synchronized electroencephalographic activity, which doesn't occur until after about a half hour into sleep.[33] So, a massaged infant sleeps better and therefore grows better. Further, massage therapy increases a preemie's serum insulin and insulin-like growth factor 1, allowing the child to gain more weight.[34] A fifth reason may be that massage therapy raises a preemie's internal temperature, even when incubator portholes remain open during the therapy,[35] and conserving body heat is a primary concern in the survival of preemies.[36] Finally, moderate-pressure massage therapy aids preterm infants in their response to pain; their heart rate increases less and returns to baseline faster than that of preemies who experience the same painful procedures but don't receive massage therapy.[37] Given that pain can interfere with brain development in the preemie,[38] massage therapy may benefit overall development.

Preterm infants who experienced further health complications before massage therapy gained more benefits from the massage therapy than those without other complications.[39] Those exposed to cocaine who were given massage therapy averaged 28 percent greater daily weight gain, showed fewer postnatal complications and fewer stress behaviors, and showed more mature motor behaviors than the control group of preemies.[40]

The benefits of massage therapy for preterm infants may positively affect later growth and development.[41] Likewise, massage has been shown to be substantially beneficial to full-term infants; indeed, tactile stimulation from birth and through the first several years of life is crucial for healthy brain development.[42] Newborns for whom touch is paired with food develop an anticipatory appetitive response, which helps in forming good feeding habits and naturally enhances overall growth.[43]

Touch stimulation positively affects physiological, behavioral, and social development, and the touch interaction between small child and caregiver is critical, particularly in communication.[44] In orphanages, children who are not touched waste away and perish.[45] In a study of infants with eating disorders, the children received little touch from their mothers and showed touch aversion.[46] Sensitive and responsive caregiving (which includes a great deal of touch) affects a child positively at least throughout the preschool years, and for a child who is maltreated in early life, an enhancement in caregiving later may help to reverse the negative effects on behavior and neurobiology.[47]

Additionally, just as preemies benefit in an extraordinary way from massage therapy, so do full-term infants who suffer from a range of risk factors. For example, when massage therapy was given to infants with depressed mothers, they gained more weight, exhibited better temperaments (they could be soothed more

easily and were more sociable), and had greater decreases in stress neurotransmitters and hormones than those who didn't receive massage therapy.[48] And autistic children showed better attentional behavior when given touch therapy; indeed, many autistic children have an aversion to touch, whereas these children accepted the touch therapy without trouble.[49]

Two other fascinating studies on infants and parents reveal important benefits of touch. In one, when depressed mothers received massage therapy, their infants fared better than those of depressed mothers who didn't receive massage therapy; the infants smiled more, babbled and talked more, and showed better orientation and motor skills, as well as more mature emotional behavior.[50] Presumably the benefits the mothers received from the tactile experience allowed them to respond to their children in ways that resulted in benefits to them. That is, the benefits of touch are passed along. A different benefit of touch is revealed in a study in which fathers massaged their infants for fifteen minutes prior to their daily bedtime for one month. At the end of the month, the fathers were more expressive and exhibited more pleasure in floor-play interactions with their infants than the fathers who had not given their infants massage therapy.[51] So, massaging carries benefits to the active participant as well as to the passive participant.

Touch and Cognition

Although many studies have been cited thus far, I don't expect the reader to be surprised at the physical, psychosocial, and emotional benefits of touch that are demonstrated in the cited studies. What is less well known as part of common wisdom is that touch has important cognitive benefits.

In studies of preemies, those who received massage therapy showed more mature orientation and habituation.[52] (Habituation is the process of growing inured to an eliciting stimulus and thus showing a decline in the elicited behavior, similar to fatigue.) Similar results with respect to cognitive activity were found in another study.[53] Touch is important to the general cognitive development of full-term infants, as well. Four-month-old babies who received massage therapy prior to carrying out an audiovisual task showed response recovery from habituation, whereas babies without the therapy did not.[54] Experiments on infants from birth up to five months of age show that infants might "perceive and understand the physical world through their hands without visual control";[55] that is, haptic abilities carry the infants from perception to cognition.

Although vision assumes a more important role than other senses after early infancy, a study of ten-year-old children demonstrated a strong correlation between overall intelligence and the ability to discriminate sensory stimuli of all types,[56] just as Francis Galton postulated more than a century ago.[57] Measures of tactile awareness in tests on roughness discrimination, part–whole matching, and pressure sensitivity show as high a correlation with intellectual ability as measures of auditory or visual acuity show, and some are better predictors of intelligence

than measures of simple sensory acuity.[58] In a battery of twenty-seven cognitive-ability and mental-speed measures, tactile-kinesthetic abilities shared much with broad visualization and fluid intelligence.[59] And the relationship between haptics and cognition is a persistent one throughout life. Tactile awareness correlates to higher-level cognitive functions in adults, as measured by palm-writing and object-identification tasks,[60] and information moves bidirectionally between tactile sensation and cognition.[61] In a study of impaired and demented elderly persons, tactile stimulation appeared to improve cognitive functioning, reduce disturbances in behavior, and beneficially influence the patient–caretaker relationship.[62]

Haptic sensory stimuli can deliver not just complex physical information (as I will discuss) but also complex abstract information. In a series of experiments involving people holding heavy or lightweight clipboards, touching hard or soft objects, and solving rough or smooth puzzles, subjects expressed impressions and made decisions about unrelated people and situations. For example, heavy clipboards made job candidates appear more important; rough surfaces made social interactions appear more difficult; and touching hard objects led to increased rigidity in negotiations between people. So, tactile sensations influenced higher social cognitive processing in dimension-specific and metaphor-specific ways, creating "an ontological scaffold for the development of intrapersonal and interpersonal conceptual and metaphorical knowledge, as well as a springboard for the application of this knowledge."[63] A very different kind of evidence for the claim that the conceptual system uses the perceptual system for the purposes of representation comes from a study based on a modality-detection task. People were subjected very briefly to a modality-specific object property (such as warm, crimson, shrill, musky, or bitter) and were asked to judge whether the property corresponded to a particular target modality and, if so, which one (tactile, visual, auditory, olfactory, or gustatory). Consistently people needed more time to detect haptic information than information corresponding to any other modality, confirming the link between sensation and cognition.[64] Some researchers have argued that our various kinesthetic engagements with our world make possible a range of cognitive activities, from apprehension to recognition and creative imagination.[65]

How haptics convey physical information, however, is the more studied area. Primates' tactile senses are sensitive and fine-tuned. Apes and humans, for example, can use touch, particularly that of the prehensile hand and fingertips, to locate objects, determine information about their substance, and even recognize their shapes "by stringing together a succession of independent chunks of information, and hence recognizing the relationship of individual parts to each other in time rather than space," as well as to detect vibrations that carry information about what lies under the surface of the objects.[66] That is, haptic systems have encoding pathways that are distinct from visual systems, and in haptic systems substance is more easily discriminated than shape.[67] Haptic and visual systems also differ on encoding pathways for size discrimination; using both senses together

yields a better estimate of size than using either alone does.[68] Still, in experiments of implicit and explicit memory within the modalities of vision and haptics as well as cross-modally between the two, no effects of modality change were noted, one explanation being representational similarities between vision and haptics.[69]

The highly rich sensory pathways of haptics make this sensorimotor continuum reliable:[70] our haptic sense is responsible for our knowledge of an object's geometry, allowing us to recognize and manipulate it.[71] Our haptic knowledge tells us when a fruit we squeeze lightly is ripe; it is also essential in making and using tools.[72] In studies of the geometric information that people can glean through feeling objects with their eyes closed, haptic perception compared well with that same kind of information gleaned through spatial vision in other studies.[73] Additionally, haptic feedback turns out to be an excellent way to learn about physics; students who were taught about gears using force-feedback-based computer simulation performed better on tests than students taught without haptic feedback.[74] Further, people used to believe that haptic information degraded immediately,[75] yet it has been shown, to the contrary, that haptic memory persists and is reliable.[76] In experiments that adapt classical paradigms in the study of human memory to haptics (such as touching a series of objects and indicating whether each object had been touched before), haptic working memory showed a high accuracy rate for both common and uncommon objects,[77] and in another study haptic memory of location of objects was strong.[78] Tactile memory, like visual and auditory memory, can be subdivided into several functionally distinct neurocognitive subsystems, some of which are short-lasting and others long-lasting. Optimal performance on tactile-memory tests occur when people are allowed to work at their own pace rather than being presented with a brief stimulus.[79] Finally, there appear to be different pathways in the tactile cortex system, one for object recognition and one for object localization, which are intertwined.[80]

Applications of Touch

A developed haptic sense is becoming ever more important in our highly technological world. Somatosensory intelligence is pertinent to everything "from the design of materials and virtual environments to the dynamics of cellular microenvironments."[81] Haptic interfaces are used in teaching academic subjects, such as physics (mentioned earlier), chemistry (in structural molecular biology),[82] and many other areas.[83] Haptic information is studied in enriching immersive telecommunication environments, so that participants can really "feel" like they are present in the remote experience,[84] particularly in the design of computer video games.[85] Information about haptic communication is gleaned from shared virtual experiences in order to help develop new human–computer interfaces and network protocols that integrate touch and force-feedback technology; potential applications include collaborative teleoperation in removing hazardous material, space-station tasks, and others.[86]

In all these and so many other areas, people with a greater haptic sensitivity and knowledge will be able to contribute to new developments. Indeed, our fine-tuned and reliable haptic sense is now used to guide and train motor systems in complex tasks. Early research showed haptic guidance to be ineffective, but more recent work (on tracking a dot moving in a two-dimensional plane with a haptic interface) suggests high potential for haptics playing a role in the motor-learning process.[87] A study comparing haptic and visual aiding in virtual-reality-based training found that when people receive only haptic assistance, they develop personal strategies, whereas when they receive only visual assistance, they rely on the aiding instead of a strategy; so, assistance needs to be properly designed to help users "with different perceptual styles." Nevertheless, a tactile-oriented person does very well in such training.[88]

In medicine, haptics are used in clinical-skill acquisition, as in medical examinations and interventions that call for touch (palpations and the like); in simulation training and in evaluating clinical skills that call for touch, such as anesthesiology, dentistry, veterinary medicine, and many others; and in newer areas of medicine that call for direct contact between patient and clinician, as with bilateral teleoperators and "smart" instruments that display tactile sensation or that use sensory-substitution systems or other methods that enhance haptic feedback to a clinician.[89] Haptic skills are particularly useful in training for minimally invasive surgery, where building up haptic sensitivity while probing a virtual object allows surgeons to develop a feeling for tool–tissue interaction that leads to more accuracy in a procedure.[90] Virtual-reality-based programs of rehabilitation are built on a haptics foundation.[91]

Haptics and Plasticity

Given all we have seen so far in this chaper, one can conclude that the person with well-developed haptics has psychosocial, emotional, and cognitive benefits, as well as additional professional opportunities. The question now is how this impinges on the deaf person. The answer is that deaf people have increased tactile sensitivity and focus simply because of their deafness, and that Deaf culture continues to promote haptic abilities throughout life.

Different areas of the brain are responsible for our different senses, but those various senses interact in neuronal convergences in networks of cortical regions of the brain called the multisensory regions.[92] Some of these regions show properties of the integration of specific senses. The caudate nucleus, for example, is for audiovisual integration and the fusiform gyrus is for visuohaptic integration, and the two show little overlap; so, neural mechanisms of sensory integration are unique to particular sensory pairings.[93] Sometimes synesthesia occurs, where a tactile stimulus, for example, might elicit a response from another sense (such as taste) or might evoke an emotion.[94] Clearly, the senses interact in the brain.

What happens to an area of the brain that would ordinarily process informa-

tion from a particular sense when that sense is not operative? Does it change? And how?

The capacity of the nervous system to modify its organization is called neuroplasticity. Neuroplasticity is variable over the course of a life, with the greatest flexibility occurring in early childhood,[95] although this plasticity varies as a function of timing (and critical periods; some abilities must be acquired before a certain age or they can never be fully acquired) and the nature of changes in experience.[96]

There is considerable evidence "that sensory deprivation is associated with cross-modal neuroplastic changes in the brain."[97] That is, a part of the brain not used for a particular sense is recruited for use by the other senses, leading to heightening of those other senses. A competing explanation for the heightening of those other senses is "unmasking"; that is, the absence of one sense (either because it was never there or because it was damaged) allows neuronal connections elsewhere to strengthen.[98] For our purposes, this debate is irrelevant. What matters is that the absence of one sense correlates with the greater strength of another. Thus, in what follows I will talk of plasticity rather than unmasking, but nothing in the argument hinges on this distinction.

Absence of a sense can be congenital, due to injury, or due to aging, and in all types there is evidence for compensatory behavior among areas of the brain. For example, after a stroke, a given function ordinarily controlled by a damaged part of the brain can reemerge through rehabilitation because another part of the brain has taken it over,[99] just as can happen after other injuries.[100] Thus, not only does absence of a sense lead to strengthening of the existent senses, but it can also lead to compensatory behavior on other parts of the brain so that work ordinarily done by one sense can be handled (at least to some extent) by another. Repeatedly, we find that sensory deprivation coupled with long- and short-term learning (that is rehabilitation or simple practice) can "dynamically modify the brain organization for the multisensory integration."[101]

A great deal of research has shown that blind people, for example, make better use of auditory input than sighted people do. In an auditory-discrimination task of detecting a rare target tone among frequent standard tones, congenitally blind participants performed better than sighted ones, suggesting that there are compensatory adaptations within the auditory modality.[102] In tests of memory of auditory verbal material, the congenitally blind participants' performance was superior to that of the sighted participants,[103] implying that the blind people encoded auditory verbal material more efficiently because of help from the visual (occipital) cortex (which is available to be co-opted). The versatility of the visual cortex with respect to processing auditory-language information is confirmed in many other studies.[104]

Likewise, blind people exhibit use of tactile skills superior to those of sighted people,[105] a phenomenon that has been attributed to greater activity in the visual

cortex evoked by tactile stimulation.[106] In the process of learning to read braille, for example, the sensorimotor cortical area devoted to the representation of the reading finger enlarges—and this is associated with recruitment of parts of the visual cortex (V1 and V2, in particular) in processing tactile information.[107] Other tactile tasks performed by the blind also show greater activity in the visual cortex.[108]

Perhaps unexpected is the fact that when sighted people undergo training specifically aimed at enhancing their tactile sense, there is evidence that their visual cortex is also involved in this enhancement; thus, cross-modal plasticity occurs even when all the senses are intact.[109] Further, depending on the temporal frequency of tactile sensation, the auditory and/or visual cortices may be activated as well as the tactile cortex.[110]

When it comes to looking at cross-modal plasticity in deaf people, quite a lot of work has established the activation of the auditory cortex in processing visual information,[111] even among deaf individuals who have cochlear implants.[112] Additionally, studies show that when deafness is considered to the exclusion of other possible confounding factors, deaf individuals exhibit selected enhanced visual cognition in comparison to hearing individuals.[113] So, the auditory cortex has been reassigned certain visual tasks, leading to better visual acuity. Additionally, the auditory cortex is engaged in processing sign languages, where information is received visually; as a result, some have argued that the auditory cortex is actually a complex of "polymodal neural tissue that has evolved unique sensitivity to aspects of the patterning of natural language"[114] rather than auditory information exclusively, in which case the term *auditory cortex* is a misnomer. I will continue to use the term, but with that caveat in mind.

In contrast, very little study has been done of deaf people's tactile abilities and of the activation of the auditory cortex as they engage in haptic events. Part of the reason for this is that research on haptics lags far behind research on vision. As Tobias Kalisch and his colleagues say, "Vision and haptics are the key modalities by which humans perceive objects and interact with their environment in a target-oriented manner," yet "compared to vision, the understanding of haptic information processing is still rudimentary."[115] Studies on hearing individuals, however, confirm that there is interaction between the auditory and the tactile cortices. When pianists engage in key-touch reading, the auditory cortex is activated, where experience (through long practice) has led to this result.[116] That means the auditory cortex has taken over some tactile functions, allowing greater tactile sensitivity simply because of practice. So, perceptual learning leads to "long lasting changes to an organism's perceptual system that improve its ability to respond to that environment and are caused by that environment."[117] Given this, there is every reason to believe that the deaf individual's auditory cortex should be recruited for other sensory experience, including tactile experience.

In fact, in a study in which people were asked to discriminate the temporal duration of touches and their spatial length, the auditory cortex was activated

much more in deaf individuals than in hearing individuals.[118] So, it is clear that the auditory cortex is recruited into tactile tasks in a more robust way among deaf people than among hearing people. However, in this particular set of tasks, that recruitment did not result in better tactile sensitivity. In particular, it appears that temporal processing (but not spatial processing) relies heavily on hearing, and plasticity is not able to compensate for this.

So, recruitment of the auditory cortex does occur in tactile events for deaf individuals, but it does not help in their perception of temporal duration. However, another study has shown that deaf people do have an extremely acute somatosensory sensitivity. Sazzad Nasir and David Ostry have found that profoundly deaf adults who have cochlear implants, when tested with their implants turned off, have precise somatosensory expectations (on the order of millimeters with respect to movement deviations).[119] These senses allowed them to use somatosensory feedback from displacing the jaw during speech to improve their speech–motor control. No hearing control group was tested, of course. Nevertheless, the somatosensory acuity of these deaf adults was considered remarkable by the researchers, which suggests that it is enhanced compared with that of hearing individuals.

The preceding study did not include scans of the cortices, so we cannot know whether the auditory cortex played a part; a study of a deaf-blind individual, however, does show that the auditory cortex is recruited in interpreting tactile information, including reading braille, detecting palm writing, and understanding a haptic form of American Sign Language (hASL), much more so than in a hearing-sighted interpreter.[120] Given that tactile enhancement in blind individuals who are not deaf involves the visual cortex (as discussed earlier), the involvement of the auditory cortex in this individual must be due to deafness, not blindness.

That the auditory cortex is activated in processing tactile information in deaf individuals is confirmed in two other studies. In one, one-hundred-millisecond tones with a bass-reflex loudspeaker were delivered to a plastic blind-ended tube once every second, where this tube was applied to the left palm and fingers of a congenitally deaf adult and six control hearing subjects; only in the deaf individual was bilateral activation of the supratemporal auditory cortices involved.[121] A more recent study looked at the processing of bimodal information: visual and tactile. Christina Karns, Mark Dow, and Helen Neville designed a headset with tubes clamped to it, which flashed light and delivered air puffs to the face of the wearer. Brain activity was measured in an MRI scanner as the subjects responded to the lights and puffs. Tactile and visual information both activated the auditory cortex of deaf individuals more than that of hearing ones, but tactile information elicited stronger responses in the auditory cortex than visual information.[122]

Touch and Deaf Gain

All this leads to the conclusion that the tactile senses of deaf people are enhanced simply by virtue of being deaf, so that concentrated attention is given to somato-

sensory information. That enhancement is further developed by the more frequent and more extensive haptic events common to Deaf culture. Ben Bahan (in this volume) describes how Deaf children learn to feel sound vibrations at an early age and how rock concerts are "tactile parties." His description makes me think of Paddy Ladd, a Deaf scholar of Deaf studies and Deaf education at the University of Bristol in the United Kingdom, who calls himself a "Deafhead" because he is a fan of the band the Grateful Dead (hearing fans call themselves Deadheads); he holds a balloon against his chest at concerts and enjoys the vibrations. Bahan also talks about how Deaf people use touch to get another's attention, sometimes with the result being misunderstanding on the part of hearing individuals that leads to lawsuits for assault. That Deaf people touch one another to express emotion and to get a person's attention is not just a matter of habit; it has beneficial results. Deaf mothers, for example, use touch frequently and effectively to maintain their deaf children's attention, much more so than do hearing mothers with their deaf children.[123] Basically, although there are different rules for what is considered acceptable touch in Deaf culture,[124] there is generally increased touching behavior during interactions between Deaf people as opposed to hearing people,[125] even in such formal situations as that of colleagues doing research together.[126] Bahan suggests that touch helps in creating a sense of belonging within Deaf culture.

Touch interaction excites the emotions, as we have discussed. So, the frequent touch interaction in Deaf culture may be one of the reasons why so many Deaf people focus on making every situation accessible to all deaf people who want to participate and on valuing their participation.[127] There are many psychosocial and political reasons for this,[128] but perhaps one of them is that touch eases the way into this effective group behavior.

The role of touch is ever more extensive and binding among deaf-blind people. Terra Edwards discusses Deaf people who gradually lose their sight, passing from vision into blindness, and she explains how the temporality in visual worlds can be transferred to tactile worlds. Just as our "feet hit the pavement at regular intervals," so tactile language is "ordered according to particular patterns of motion and rest."[129] She considers at length how her deaf-blind subjects use the range of classifiers in ASL—those for size or shape, entity, and handling—and discusses the role these classifiers play in a tactile world.

The classifiers are telling with respect to our interest here. Although many signs in ASL have an articulatory form that is arbitrarily related to their meaning, this is not true of the classifiers. Instead, classifiers are identified crucially by their hand shape, and that hand shape is meaningful. This is easy to see in size-shape classifiers, of course, but is it also obvious in handling classifiers, which show how the hands move or position themselves in manipulating the relevant object. Sarah Taub says, "The use of body and instrument classifiers is strongly motivated by the distinctiveness of body actions: sometimes it is easier to produce and recognize body movements associated with an object than an analogue of the

object itself."[130] Dan Slobin and his colleagues add, "Often such handshapes are literal gestures of an activity, and it is only the factor of conventionalization in the speech community that distinguishes sign from gesture."[131] But even the entity classifiers have articulatory parts that are meaningful. As Rachel Sutton-Spence and I point out, although the referent of the hand shape is typically unlike a hand (such as a car or book or cat), signers readily select relevant points of comparison between hand shape and meaning and feel free to manipulate them in ways appropriate to that implicit analogy.[132] Dan Slobin's group further says that the hand shape indexes "a particular referent according to properties that are appropriate for the current discourse. That is, the 'classifier' handshape designates, or specifies, or indicates a referent with a particular property (e.g., two-legged, horizontal plane, etc.)."[133] Signers can talk about a car crash, for example, and if the front end of the car gets crushed, they can flex the interphalangeal joints of the index finger and middle finger of the "3" hand shape (the vehicle classifier) to show that. Indeed, if the crushing happened slowly, or if the signer wants to convey that sense of slow motion that can sometimes occur in the middle of a terrifying experience, the fingers can curl slowly. So, the very (form of the) hand becomes the car; internal parts of the hand distort to show the distortion of the crushed car.

Sign-language poets often go much further with this physical appropriation of language, both with the classifiers[134] and with embodiment. Debbie Rennie, as the main character in her ASL poem "Black Hole: Color ASL," is perched on the top of a ladder. When people shake the ladder from below, she flaps her arms to try to regain balance, and those flapping arms transform into wings that carry her away. She flies.[135] When Paul Scott, as the narrator in his BSL poem "Too Busy to Hug, Too Blind to See," becomes a mountain and trees grow out his sides, he twists away from the painful pokes. He writhes.[136] And we, the audience, feel what the poet feels. We soar with Debbie Rennie; we suffer with Paul Scott.

So much of sign languages is open to a tactile interpretation. When a deaf-blind person remembers the sight of a sloped roof, her hands can make it in ASL and her whole body can understand it in a somatosensory way. Edwards says, "In this way, American Sign Language, whether instantiated in a visual world or a tactile world, has a tactile dimension for sighted and blind people alike."[137] How true. The very medium of a sign language is somatosensory. Although spoken language is articulated by the speech tract and thus calls for physical involvement of parts of the speaker's body, that involvement is, to a huge extent, arbitrarily related to meaning. Because a sign language is articulated by a much larger part of the body—the manuals as well as the extensive nonmanuals—and because the signer's body movements, shapes, and positions are, to a much greater extent, strongly related to meaning, the signer experiences language differently at a cognitive level; the somatosensory system and the language mechanism in the brain feed each other in a synergistic way. Language becomes the signer; the signer becomes language. The understanding of how deep a river is, how cold a wind is, even how searing

a heartbreak is—these things can be conveyed in spoken language, of course, but we appreciate their semantic resonance so much more if the speaker's physical self beyond the speech tract is involved in the message, which is why we watch in awe as an internal conflict plays across the face of an actress like Laura Linney in the 2003 British film *Love Actually*. But in a sign language, even ordinary conversation engages a great deal of the speaker's physical self. In this way, ordinary conversation in a sign language involves a deeper understanding of the message—it is bone deep, literally. That's one of the gifts that the somatosensory involvement of a sign language gives the signer. Sign languages are the jewels of Deaf Gain.

Researchers have found that using gesture facilitates people's reasoning abilities,[138] perhaps by offering a way to express and explore concepts that may be difficult to negotiate in a verbal way.[139] For example, the use of gestures helps children solve spatial-transformation tasks, raising the possibility that gesture training may help in improving mental-rotation skills.[140] What we need now is an investigation of whether using touch facilitates reasoning abilities. So let this chapter be a call to arms, so to speak.

In the meantime, we can conclude that being audiologically deaf confers on a person increased tactile attention and acuity, and all the many benefits that ensue. Being part of Deaf culture nurtures that sense. And using a sign language, in particular, enriches one's cognitive understanding of human communication and, thus, of what it means to be human. So, the next time you are offered a full-body hug, hug back. It may make both of you smarter, and it will surely make you happier.

Notes

1. Jonathan Turner, "The Nature and Dynamics of the Social among Humans," in *The Mark of the Social*, ed. John D. Greenwood (New York: Rowman & Littlefield, 1997), 107.
2. John Napier and Prue Napier, *The Natural History of the Primates* (Cambridge, Mass.: MIT Press, 1985); Signe Preuschoft and Holger Preuschoft, "Primate Nonverbal Communication: Our Communicative Heritage," in *Origins of Semiosis: Sign Evolution in Nature and Culture*, ed. Winfried Nöth (Berlin: Walter de Gruyter, 1994), 61–102.
3. Turner, "The Nature and Dynamics of the Social among Humans," 107.
4. Ibid., 117.
5. Preuschoft and Preuschoft, "Primate Nonverbal Communication," 68.
6. Ibid., 70.
7. Elizabeth D. Harvey, ed., *Sensible Flesh: On Touch in Early Modern Culture* (Philadelphia: University of Pennsylvania Press, 2003).
8. Jana M. Iverson, "Developing Language in a Developing Body: The Relationship between Motor Development and Language Development," *Journal of Child Language* 37, no. 2 (2010): 242.
9. Kelly Klein, "The Touch Project: Performing Gender across and through Our Skins" (undergraduate senior thesis, Honors College, Wesleyan University, 2008), available at http://www.pickupamerica.org/sites/default/files/2010/01/kellykleinthesis20081.pdf.
10. Raymond Firth, "Verbal and Bodily Rituals of Greeting and Parting," in *The Interpretation of Ritual: Essays in Honour of A. I. Richards*, ed. Jean S. La Fontaine (London: Routledge, 1972), 1–38.

11. Torbjörn Lundmark, *Tales of Hi and Bye: Greeting and Parting Rituals around the World* (Cambridge: Cambridge University Press, 2009).
12. Kim Dammers, "Gestures and Body Language Used in Public Greetings and Departures in Addis Ababa," in *Schweifgebiete: Festschrift für Ulrich Braukämper,* ed. Alke Dohrmann, Dirk Bustorf, and Nicole Poissonnier (Münster: Lit Verlag, 2010), 60–65.
13. Firth, "Verbal and Bodily Rituals of Greeting and Parting," 16.
14. Lundmark, *Tales of Hi and Bye.*
15. Peter Andersen, *Nonverbal Communication: Forms and Functions* (Long Grove, Ill.: Waveland Press, 2008), pt. 3.
16. Nancy M. Henley, *Body Politics: Power, Sex, and Nonverbal Communication* (Englewood Cliffs, N.J.: Prentice-Hall, 1997).
17. Antonio Damasio, *The Feeling of What Happens: Body, Emotion, and the Making of Consciousness* (London: Heinemann, 1999).
18. Matthew J. Hertenstein et al., "The Communication of Emotion via Touch," *Emotion* 9, no. 4 (2009): 566–73.
19. Virginia P. Richmond and James C. McCroskey, *Nonverbal Behavior in Interpersonal Relations,* 5th ed. (Boston: Allyn & Bacon, 2004).
20. Laura E. Marler et al., "Exploring the Role of Touch and Apologies in Forgiveness of Workplace Offenses," *Journal of Managerial Issues* 23, no. 2 (2011): 144.
21. Stanley E. Jones, "Communicating with Touch," in *The Nonverbal Communication Reader: Classic and Contemporary Readings,* ed. Laura K. Guerrero, Joseph A. DeVito, and Michael L. Hecht (Prospect Heights, Ill.: Waveland Press, 1999), 196.
22. Tiffany Field, *Touch* (Cambridge, Mass.: MIT Press, 2001), 9.
23. Maya Angelou, "Maya on Oprah," Maya Angelou, Vibrant Word, accessed February 11, 2014, http://www.vibrantword.com/maya_angelou.html.
24. Darwin W. Muir, "Adult Communications with Infants through Touch: The Forgotten Sense," *Human Development* 45, no. 2 (2002): 95–99.
25. T. Berry Brazelton, "Fetal Observations: Could They Relate to Another Modality, Such as Touch?," in *Touch in Early Development,* ed. Tiffany Field (Los Angeles: Erlbaum, 1995), 11–18.
26. Muir, "Adult Communications with Infants through Touch."
27. Abdulmotaleb El Saddik et al., *Haptics Technologies: Bringing Touch to Multimedia* (Berlin: Springer Verlag, 2011).
28. Tiffany Field et al., "Tactile/Kinesthetic Stimulation Effects on Preterm Neonates," *Pediatrics* 77 (1986): 654–58.
29. Tiffany Field et al., "Moderate versus Light Pressure Massage Therapy Leads to Greater Weight Gain in Preterm Infants," *Infant Behavior and Development* 29 (2006): 574–78.
30. Miguel A. Diego et al., "Preterm Infant Massage Elicits Consistent Increases in Vagal Activity and Gastric Motility That Are Associated with Greater Weight Gain," *Acta Paediatrica* 96, no. 11 (2007): 1588–91.
31. Cynthia Kuhn et al., "Tactile Kinesthetic Stimulation Effects on Sympathetic and Adrenocortical Function in Preterm Infants," *Journal of Pediatrics* 119 (1991): 434–40.
32. Maria Hernandez-Reif, Miguel Diego, and Tiffany Field, "Preterm Infants Show Reduced Stress Behaviors and Activity after Five Days of Massage Therapy," *Infant Behavior and Development* 30 (2007): 557–61.
33. Jon F. Sassin et al., "Effects of Slow Wave Sleep Deprivation on Human Growth Hormone Release in Sleep: Preliminary Study," *Life Sciences* 8, no. 23 (1969): 1299–307.
34. Tiffany Field et al., "Insulin and Insulin-Like Growth Factor I (IGF-1) Increase in Preterm Infants following Massage Therapy," *Journal of Developmental and Behavioral Pediatrics* 29 (2008): 463–66.
35. Miguel A. Diego, Tiffany Field, and Maria Hernandez-Reif, "Temperature Increases in Pre-

term Infants during Massage Therapy," *Infant Behavior and Development* 31 (2008): 149–52.
36. See studies such as Daniele Trevisanuto et al., "Heat Loss Prevention in Very Preterm Infants in Delivery Rooms: A Prospective, Randomized, Controlled Trial of Polyethylene Caps," *Journal of Pediatrics* 156, no. 6 (2010): 914–17.
37. Miguel A. Diego, Tiffany Field, and Maria Hernandez-Reif, "Procedural Pain Heart Rate Responses in Massaged Preterm Infants," *Infant Behavior and Development* 32 (2009): 226–29.
38. Susanne Brummelte et al., "Procedural Pain and Brain Development in Premature Newborns," *Annals of Neurology* 71, no. 3 (2012): 385–96.
39. Frank Scafidi, Tiffany Field, and Saul Schanberg, "Factors That Predict Which Preterm Infants Benefit Most from Massage Therapy," *Journal of Developmental and Behavioral Pediatrics* 14 (1993): 176–80.
40. Abigail Wheeden et al., "Massage Effects on Cocaine-Exposed Preterm Neonates," *Journal of Developmental and Behavioral Pediatrics* 14 (1993): 318–22.
41. Tiffany Field, Frank Scafidi, and Saul Schanberg, "Massage of Preterm Newborns to Improve Growth and Development," *Pediatric Nursing* 13 (1987): 385–87.
42. Bruce D. Perry, "Childhood Experience and the Expression of Genetic Potential: What Childhood Neglect Tells Us about Nature and Nurture," *Brain and Mind* 3, no. 1 (2002): 79–100; Sue Gerhardt, *Why Love Matters: How Affection Shapes a Baby's Brain* (Hove, UK: Brunner-Routledge, 2004).
43. Elliott M. Blass, Judith R. Ganchrow, and Jacob E. Steiner, "Classical Conditioning in Newborn Humans 2–48 Hours of Age," *Infant Behavior and Development* 7, no. 2 (1984): 223–35.
44. Dale Stack, "The Salience of Touch and Physical Contact during Infancy: Unraveling Some of the Mysteries of the Somesthetic Sense," in *Blackwell Handbook of Infant Development,* ed. Gavin Bremner and Alan Fogel (London: Blackwell, 2004), 351–78.
45. Ashley Montagu, *Touching: The Human Significance of the Skin* (New York: Columbia University Press, 1978).
46. Ruth Feldman et al., "Mother–Child Touch Patterns in Infant Feeding Disorders: Relation to Maternal, Child, and Environmental Factors," *Journal of the American Academy of Child and Adolescent Psychiatry* 43, no. 9 (2004): 1089–97.
47. For overview and discussion, see Megan R. Gunnar and Carol L. Cheatham, "Brain and Behavior Interface: Stress and the Developing Brain," *Infant Mental Health Journal* 24, no. 3 (2003): 195–211.
48. Tiffany Field et al., "Massage Therapy for Infants of Depressed Mothers," *Infant Behavior and Development* 19 (1996): 107–12.
49. Tiffany Field et al., "Brief Report: Autistic Children's Attentiveness and Responsivity Improve after Touch Therapy," *Journal of Autism and Developmental Disorders* 27, no. 3 (1997): 333–38.
50. Tiffany Field, Maria Hernandez-Reif, and Miguel Diego, "Newborns of Depressed Mothers Who Received Moderate versus Light Pressure Massage during Pregnancy," *Infant Behavior and Development* 29 (2006): 54–58.
51. Christy Cullen et al., "Father-Infant Interactions Are Enhanced by Massage Therapy," *Early Child Development and Care* 164 (2000): 41–47.
52. Frank Scafidi et al., "Effects of Tactile/Kinesthetic Stimulation on the Clinical Course and Sleep/Wake Behavior of Preterm Neonates," *Infant Behavior and Development* 9 (1986): 91–105.
53. Frank Scafidi et al., "Massage Stimulates Growth in Preterm Infants: A Replication," *Infant Behavior and Development* 13 (1990): 167–88.
54. Maricel Cigales et al., "Massage Enhances Recovery from Habituation in Normal Infants," *Infant Behavior and Development* 20, no. 1 (1997): 29–34.
55. Arlette Streri and Julie Féron, "The Development of Haptic Abilities in Very Young Infants:

From Perception to Cognition," *Infant Behavior and Development* 28, no. 3 (2005): 290.

56. Christine Sandra Meyer et al., "Correspondence between the General Ability to Discriminate Sensory Stimuli and General Intelligence," *Journal of Individual Differences* 31, no. 1 (2010): 46–56.
57. Francis Galton, *Inquiries into Human Faculty* (London: Dent, 1883).
58. Shu-Chen Li, Malina Jordanova, and Ulman Lindenberger, "From Good Senses to Good Sense: A Link between Tactile Information Processing and Intelligence," *Intelligence* 26, no. 2 (1998): 99–122.
59. Richard Roberts et al., "Charting the Cognitive Sphere: Tactile-Kinesthetic Performance within the Structure of Intelligence," *Intelligence* 25, no. 2 (1997): 111–48.
60. Scott L. Decker, "Tactile Measures in the Structure of Intelligence," *Canadian Journal of Experimental Psychology* 64, no. 1 (2010): 53–59.
61. Charles Spence and Alberto Gallace, "Recent Developments in the Study of Tactile Attention," *Canadian Journal of Experimental Psychology* 61 (2007): 196–207.
62. Marijn Luijpen et al., "Non-pharmacological Interventions in Cognitively Impaired and Demented Patients: A Comparison with Cholinesterase Inhibitors," *Reviews in the Neurosciences* 14, no. 4 (2003): 343–68.
63. Joshua Ackerman, Christopher C. Nocera, and John A. Bargh, "Incidental Haptic Sensations Influence Social Judgments and Decisions," *Science* 328, no. 5986 (2010): 1712.
64. Louise Connell and Dermot Lynott, "Hard to Put Your Finger on It: Haptic Modality Disadvantage in Conceptual Processing," *Proceedings of the Thirty-First Annual Meeting of the Cognitive Science Society* (2009): 1–6.
65. Susan A. J. Stuart, "From Agency to Apperception: Through Kinaesthesia to Cognition and Creation," *Ethics and Information Technology* 10, no. 4 (2008): 255–64.
66. Alexandra Maryanski, "Primate Communication and the Ecology of a Language Niche," in *Nonverbal Communication: Where Nature Meets Culture,* ed. Ullica Segerstrale and Peter Molnar (Mahwah, N.J.: Erlbaum, 1997), 195–96.
67. Roberta L. Klatzky, Susan J. Lederman, and Catherine Reed, "There's More to Touch Than Meets the Eye: The Salience of Object Attributes for Haptics with and without Vision," *Journal of Experimental Psychology* 116, no. 4 (1987): 356–69.
68. Sergei Gepshtein and Martin S. Banks, "Viewing Geometry Determines How Vision and Haptics Combine in Size Perception," *Current Biology* 13, no. 6 (2003): 483–88.
69. Randolph D. Easton, Kavitha Srinivas, and Anthony J. Greene, "Do Vision and Haptics Share Common Representations? Implicit and Explicit Memory within and between Modalities," *Journal of Experimental Psychology: Learning, Memory, and Cognition* 23, no. 1 (1997): 153–63.
70. Evren Samur, "Human Haptic Perception," in *Performance Metrics for Haptic Interfaces* (Berlin: Springer, 2012), 27–39.
71. Margaret McLaughlin, Joao P. Hespanha, and Gaurav S. Sukhatme, *Touch in Virtual Environments: Haptics and the Design of Interactive Systems* (Upper Saddle River, N.J.: Prentice Hall, 2002).
72. Pietro Morasso, "The Crucial Role of Haptic Perception," in *Artificial Consciousness,* ed. Riccardo Manzotti and Antonio Chella (Exeter, UK: Imprint Academic, 2007), 234–55.
73. Denise Y. P. Henriques and John F. Seochting, "Bias and Sensitivity in the Haptic Perception of Geometry," *Experimental Brain Research* 150, no. 1 (2003): 95–108.
74. Greg Hallman et al., "Possibilities of Haptic Feedback Simulation for Physics Learning," in *Proceedings of World Conference on Educational Multimedia, Hypermedia, and Telecommunications,* ed. George Siemens and Catherine Fulford (Chesapeake, Va.: AACE, 2009), 3597–602.
75. Preuschoft and Preuschoft, "Primate Nonverbal Communication," 68.
76. For an overview of haptic memory in particular, see Jude Nicholas, *From Active Touch to Tactile Communication: What's Tactile Cognition Got to Do with It?* (Aalborg, Denmark: Dan-

ish Resource Centre on Congenital Deafblindness, 2010).

77. For an overview of the literature as well as reports on several new studies, see Alexandra Maria Marques Fernandes, "Haptic Working Memory: Performance in Interference Tasks and Span Tasks with Everyday Objects" (doctoral diss., Universidade do Minho, Braga, Portugal, 2012).
78. Jude Nicholas and Anny Koppen, "Understanding the Tactile Brain," *Conference Proceedings, Fourteenth Deafblind International (Dbl) World Conference* (Perth, Australia, 2007).
79. Alberto Gallace and Charles Spence, "The Cognitive and Neural Correlates of Tactile Memory," *Psychological Bulletin* 135, no. 3 (2009): 380–406.
80. Catherine L. Reed, Roberta L. Klatzky, and Eric Halgren, "What vs. Where in Touch: An fMRI Study," *NeuroImage* 25 (2005): 718–26.
81. Bradly Alicea, "Control in Technological Systems and Physical Intelligence: An Emerging Theory" (paper presented at Midwest Cognitive Science Meeting 2011, Michigan State University, East Lansing, Michigan, April 16, 2011).
82. Ganesh Sankaranarayanan et al., "Role of Haptics in Teaching Structural Molecular Biology," in *Eleventh Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems: Haptics 2003* (Los Alamitos, Calif.: IEEE Computer Society, Technical Committee on Visualization and Graphics, 2003), e-book, 363–66.
83. Anne Mangen, "Point and Click: Theoretical and Phenomenological Reflections on the Digitization of Early Childhood Education," *Contemporary Issues in Early Childhood* 11, no. 4 (2010): 415–31.
84. Miriam Reiner, "The Role of Haptics in Immersive Telecommunication Environments," *Circuits and Systems for Video Technology: IEEE Transactions* 14, no. 3 (2004): 392–401.
85. Mathias Nordvall, "SIGHTLENCE: Haptics for Computer Games" (doctoral diss., Linköping University, Linköping, Sweden, 2012).
86. Cagatay Basdogan et al., "An Experimental Study on the Role of Touch in Shared Virtual Environments," *ACM Transactions on Computer-Human Interaction (TOCHI)* 7, no. 4 (2000): 443–60.
87. Jaebong Lee and Seungmoon Choi, "Effects of Haptic Guidance and Disturbance on Motor Learning: Potential Advantage of Haptic Disturbance," *IEEE Haptics Symposium, 2010* (2010): 335–42.
88. Michael Clamann and David B. Kaber, "The Effects of Haptic and Visual Aiding on Psychomotor Task Strategy Development during Virtual Reality-Based Training," *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* 56, no. 1 (2012): 2570.
89. Allison M. Okamura et al., "Haptics in Medicine and Clinical Skill Acquisition," special section introduction, *Haptics: IEEE Transactions* 4, no. 3 (2011): 153–54; Timothy R. Coles, Dwight Meglan, and Nigel W. John, "The Role of Haptics in Medical Training Simulators: A Survey of the State of the Art," *Haptics: IEEE Transactions* 4, no. 1 (2011): 51–66.
90. Cagatay Basdogan et al., "Haptics in Minimally Invasive Surgical Simulation and Training," *Computer Graphics and Applications: IEEE* 24, no. 2 (2004): 56–64; Edward Dibble, Aleksandar Zivanovic, and Brian Davies, "A One Degree of Freedom Haptic System to Investigate Issues in Human Perception with Particular Application to Probing Tissue," *Studies in Health Technology and Informatics* 98 (2004): 69–71.
91. See, for example, Uri Feintuch, Rachel Kizony, and Patrice L. Weiss, "Promoting Research and Clinical Use of Haptic Feedback in Virtual Environments," *Proceedings of the Fifth International Conference on Disability, Virtual Reality, and Associated Technologies* (Reading, UK: University of Reading, 2004), 141–47.
92. Noa Tal and Amir Amedi, "Multisensory Visual-Tactile Object Related Network in Humans: Insights Gained Using a Novel Crossmodal Adaptation Approach," *Experimental Brain Research* 198, nos. 2–3 (2009): 165–82.
93. Ryan Stevenson, Sunah Kim, and Thomas W. James, "An Additive-Factors Design to Disambiguate Neuronal and Areal Convergence: Measuring Multisensory Interactions

between Audio, Visual, and Haptic Sensory Streams Using fMRI," *Experimental Brain Research* 198, nos. 2–3 (2009): 183–94.

94. Vilayanur S. Ramachandran and David Brang, "Tactile-Emotion Synesthesia," *Neurocase: The Neural Basis of Cognition* 14, no. 5 (2008): 390–99; Jamie Ward and Thomas Wright, "Sensory Substitution as an Artificially Acquired Synaesthesia," *Neuroscience and Biobehavioral Reviews* (forthcoming), available through http://www.sciencedirect.com/science/article/pii/S0149763412001200.
95. Andreja Bubic, Ella Striem-Amit, and Amir Amedi, "Large-Scale Brain Plasticity following Blindness and the Use of Sensory Substitution Devices," in *Multisensory Object Perception in the Primate Brain,* ed. Marcus Johannes Naumer and Jochen Kaiser (Berlin: Springer, 2010), 351–80.
96. Daphne Bavelier and Helen J. Neville, "Cross-Modal Plasticity: Where and How?" *Nature Reviews Neuroscience* 3, no. 6 (2002): 443–52.
97. Lofti B. Merabet and Alvaro Pascual-Leone, "Neural Reorganization following Sensory Loss: The Opportunity of Change," *Nature Reviews Neuroscience* 11, no. 1 (2009): 44.
98. Roi Cohen Kadosh and Vincent Walsh, "Cognitive Neuroscience: Rewired or Crosswired Brains?," *Current Biology* 16, no. 22 (2006): R962–63.
99. For discussion, see Mark Hallett, "Plasticity of the Human Motor Cortex and Recovery from Stroke," *Brain Research Reviews* 36 (2001): 169–74.
100. Patrice Voss et al., "Adaptation to Sensory Loss," *Wiley Interdisciplinary Reviews: Cognitive Science* 1, no. 3 (2010): 308–28.
101. Norihiro Sadato, "How the Blind 'See' Braille: Lessons from Functional Magnetic Resonance Imaging," *Neuroscientist* 11, no. 6 (2005): 577.
102. Brigitte Röder, Frank Rösler, and Helen J. Neville, "Effects of Interstimulus Interval on Auditory Event-Related Potentials in Congenitally Blind and Normally Sighted Humans," *Neuroscience Letters* 264, no. 1 (1999): 53–56.
103. Brigitte Röder, Frank Rösler, and Helen J. Neville, "Auditory Memory in Congenitally Blind Adults: A Behavioral-Electrophysiological Investigation," *Cognitive Brain Research* 11, no. 2 (2001): 289–303.
104. See, for example, Sam J. Gilbert and Vincent Walsh, "Vision: The Versatile 'Visual' Cortex Dispatch," *Current Biology* 14 (2004): R1056–57.
105. Ron Kupers et al., "Transcranial Magnetic Stimulation of the Visual Cortex Induces Organized Qualia in Blind Subjects," *Proceedings of the National Academy of Sciences USA* 103 (2006): 13256–60; Maurice Ptito, Daniel-Robert Chebat, and Ron Kupers, "The Blind Get a Taste of Vision," in *Human Haptic Perception: Basics and Applications,* ed. Martin Grunwald (Berlin: Birkhäuser Verlag, 2008), 481–89.
106. Leonardo G. Cohen et al., "Period of Susceptibility for Cross-Modal Plasticity in the Blind," *Annals of Neurology* 45 (1999): 451–60.
107. Roy H. Hamilton and Alvaro Pascual-Leone, "Cortical Plasticity Associated with Braille Learning," *Trends in Cognitive Sciences* 2, no. 5 (1998): 168–74; Norihiro Sadato et al., "Activation of the Primary Visual Cortex by Braille Reading in Blind Subjects," *Nature* 380, no. 6574 (1996): 526–28; Norihiro Sadato et al., "Neural Networks for Braille Reading by the Blind," *Brain* 121, no. 7 (1998): 1213–29; Norihiro Sadato et al., "Critical Period for Cross-Modal Plasticity in Blind Humans: A Functional MRI Study," *Neuroimage* 16, no. 2 (2002): 389–400; Leonardo G. Cohen et al., "Functional Relevance of Cross-Modal Plasticity in Blind Humans," *Nature* 389, no. 6647 (1997): 180–82; Cohen et al., "Period of Susceptibility for Cross-Modal Plasticity in the Blind."
108. Brigitte Röder, Frank Rösler, and Erwin Hennighausen, "Different Cortical Activation Patterns in Blind and Sighted Humans during Encoding and Transformation of Haptic Images," *Psychophysiology* 34, no. 3 (2007): 292–307.
109. Daisuke N. Saito et al., "Practice Makes Perfect: The Neural Substrates of Tactile Dis-

crimination by Mah-Jong Experts Include the Primary Visual Cortex," *BMC Neuroscience* 7, no. 1 (2006): 79.

110. Per F. Nordmark, J. Andrew Pruszynski, and Roland S. Johansson, "BOLD Responses to Tactile Stimuli in Visual and Auditory Cortex Depend on the Frequency Content of Stimulation," *Journal of Cognitive Neuroscience* 24, no. 10 (2012): 2120–34.
111. See, for example, Hiroshi Nishimura et al., "Sign Language 'Heard' in the Auditory cortex," *Nature* 397, no. 6715 (1999): 116; Helen Neville and Daphne Bavelier Hofman, "Human Brain Plasticity: Evidence from Sensory Deprivation and Altered Language Experience," in *Plasticity in the Adult Brain: From Genes to Neurotherapy,* ed. Michel A. Hofman et al. (Amsterdam: Elsevier, 2002), 177–90; Norihiro Sadato et al., "Age-Dependent Plasticity in the Superior Temporal Sulcus in Deaf Humans: A Functional MRI Study," *BMC Neuroscience* 5, no. 1 (2004): 56; Qiang Li, Shuang Xia, and Fei Zhao, "An FMRI Picture Study of Chinese Sign Language in Functional Cortex of Prelingual Deaf Signers Use Computer," in *Computer Science for Environmental Engineering and Eco-Informatics,* ed. Yuanzu Yu, Zhengtao Yu, and Jingying Zha (Heidelberg: Springer, 2011), 348–55.
112. Pascale Sandmann et al., "Visual Activation of Auditory Cortex Reflects Maladaptive Plasticity in Cochlear Implant Users," *Brain* 135, no. 2 (2012): 555–68.
113. Daphne Bavelier, Matthew W. G. Dye, and Peter C. Hauser, "Do Deaf Individuals See Better?" *Trends in Cognitive Sciences* 10, no. 11 (2006): 512–18.
114. Laura Ann Petitto et al., "Speech-Like Cerebral Activity in Profoundly Deaf People Processing Signed Languages: Implications for the Neural Basis of Human Language," *Proceedings of the National Academy of Sciences* 97, no. 25 (2000): 13961.
115. Tobias Kalisch et al., "Cognitive and Tactile Factors Affecting Human Haptic Performance in Later Life," *PloS One* 7, no. 1 (2012): e30420.
116. Takehiro Hasegawa et al., "Learned Audio-visual Cross-Modal Associations in Observed Piano Playing Activate the Left Planum Temporale: An fMRI Study," *Cognitive Brain Research* 20, no. 3 (2004): 510–18.
117. Hubert R. Dinse, Claudia Wilimzig, and Tobias Kalisch, "Learning Effects in Haptic Perception," in Grunwald, *Human Haptic Perception,* 165.
118. Nadia Bolognini et al., "Hearing Shapes Our Perception of Time: Temporal Discrimination of Tactile Stimuli in Deaf People," *Journal of Cognitive Neuroscience* 24, no. 2 (2012): 276–86.
119. Sazzad Nasir and David J. Ostry, "Speech Motor Learning in Profoundly Deaf Adults," *Nature Neuroscience* 11, no. 10 (2008): 1217–22.
120. Souzana Obretenova et al., 2009. "Neuroplasticity Associated with Tactile Language Communication in a Deaf-Blind Subject," *Frontiers in Human Neuroscience* 3 (2009): 60.
121. Sari Levänen, Veikko Jousmäki, and Riitta Hari, "Vibration-Induced Auditory-Cortex Activation in a Congenitally Deaf Adult," *Current Biology* 8 (1998): 869–72.
122. Christina M. Karns, Mark W. Dow, and Helen J. Neville, "Altered Cross-Modal Processing in the Primary Auditory Cortex of Congenitally Deaf Adults: A Visual-Somatosensory fMRI Study with a Double-Flash Illusion," *Journal of Neuroscience* 32, no. 28 (2012): 9626–38.
123. Grace Silvia, "Emotional Availability and Touch among Deaf and Hearing Mother-Infant Dyads" (PhD diss., University of Montana at Missoula, 2011).
124. Timothy Reagan, "A Sociocultural Understanding of Deafness: American Sign Language and the Culture of Deaf People," *International Journal of Intercultural Relations* 19, no. 2 (1995): 239–51.
125. Blaine Goss, "Hearing from the Deaf Culture," *Intercultural Communication Studies* 12, no. 2 (2003): 1–16.
126. Lesley Jones and Gloria Pullen, "Cultural Differences: Deaf and Hearing Researchers

Working Together," *Disability, Handicap, and Society* 7, no. 2 (1992): 189–96.

127. See, for example, Carol Padden and Tom Humphries, *Inside Deaf Culture* (Cambridge, Mass.: Harvard University Press, 2005).
128. Martina J. Bienvenu, "Third Culture: Working Together," *Journal of Interpretation* 4 (1987): 1–12.
129. Terra Edwards, "Sensing the Rhythms of Everyday Life: Temporal Integration and Tactile Translation in the Seattle Deaf-Blind Community," *Language in Society* 41, no. 1 (2012): 55.
130. Sarah Taub, *Language from the Body: Iconicity and Metaphor in American Sign Language* (Cambridge: Cambridge University Press, 2001), 77.
131. Dan Slobin et al., "A Cognitive/Functional Perspective on the Acquisition of 'Classifiers,'" in *Perspectives on Classifier Constructions in Sign Languages*, ed. Karen Emmorey (Mahwah, N.J.: Erlbaum, 2003), 280.
132. Rachel Sutton-Spence and Donna Jo Napoli, "How Much Can Classifiers Be Analogous to Their Referents?," *Gesture* 13, no. 1 (2013): 1–27.
133. Slobin et al., "A Cognitive/Functional Perspective on the Acquisition of 'Classifiers,'" 273.
134. Sutton-Spence and Napoli, "How Much Can Classifiers Be Analogous to Their Referents?"
135. Debbie Rennie, "Black Hole: Color ASL," *Poetry in Motion* (Burtonsville, Md.: Sign Media, 1989).
136. Paul Scott, "Too Busy to Hug, Too Blind to See," "Poems by Professionals," University of Bristol, Graduate School of Education, http://www.bristol.ac.uk/bslpoetryanthology.
137. Edwards, "Sensing the Rhythms of Everyday Life," 56.
138. Susan Goldin-Meadow, "The Role of Gesture in Communication and Thinking," *Trends in Cognitive Sciences* 3, no. 11 (1999): 419–29; Susan Goldin-Meadow, "Beyond Words: The Importance of Gesture to Researchers and Learners," *Child Development* 71, no. 1 (2003): 231–39.
139. Susan Goldin-Meadow, *Hearing Gesture: How Our Hands Help Us Think* (Cambridge, Mass.: Harvard University Press, 2003).
140. Stacy B. Ehrlich, Susan C. Levine, and Susan Goldin-Meadow, "The Importance of Gesture in Children's Spatial Reasoning," *Developmental Psychology* 42, no. 6 (2006): 1259–68.

14

SENSES AND CULTURE

Exploring Sensory Orientations

BENJAMIN BAHAN

Approximately fifteen years ago, I interviewed a Deaf man from the Zambezi River basin in southern Africa about his experiences growing up in a small town. The nearest city could be reached only by a walk through the jungle. If I had to walk through a jungle, I'd stop intermittently to check my surroundings for lions and other animals. I asked, "Did you often stop and check your surroundings while passing through the jungle?" He said, "Not really, no, because I can smell danger."

I found that a difficult concept to grasp. I thought about the environment I had grown up in. Perhaps I could detect gas leaking from the stove, but what else could I smell that would qualify as danger? As I struggled to relate, I realized that although he and I were similar in that we both were Deaf, we had different cultural experiences and cultural interpretations of an assortment of sensory experiences.

The man explained that he could smell an animal's markings as he walked through the jungle, such as urine or even an animal's corpse. Through the sense of smell, he could immediately identify what types of animals were in the vicinity. I understood that what he was saying meant not that I was unable to smell those scents but rather that I was from a culture that didn't incorporate this awareness. Yet in this man's culture, it was a way of life; this heightened sense of smell became a natural part of people's beings and was integrated into their daily walks.

As Edward Hall explains, "[P]eople of different cultures don't only speak different languages, but what is possibly more important inhabit different sensory worlds."[1] Hall raises an interesting point. We are familiar with the five senses: sound, sight, taste, touch, and smell. However, each sense possibly has a different meaning or interpretation in different cultures. One such instance of this is how sound is controlled and what it means in different cultures. A burp may be a positive sound in one culture but may hold an entirely different meaning in another. With sight, what is beautiful in one culture might not be beautiful at all in another. Taste is quite divergent across cultures as well. Different cultures have different norms for acceptable types of touch; some cultures allow for more physical

touching, whereas other cultures do not encourage touching. As part of the physical-touching space, we notice the existence of a wide variety of architectures across cultures. There are also numerous smells, such as the smell of perfumes.

Sense plays a very important role in human communication: "Communication constitutes the core of culture and indeed of life itself."[2] The sensory outcome has led to two general ways that human languages are expressed: the audio-vocal and visual-tactile orientations. These two tracks, in fact, are universal.[3] Each orientation includes aspects of the other, but each orientation's primary message system has different operations. The visual-tactile modality obviously is more visual and tactile, whereas the audio-vocal modality is more aural and vocal. William Stokoe suggested that some cultures consider both modalities equal.[4]

Visual-Tactile Orientation

Gestures are natural. All languages and cultures use gestures, with or without speech. Gestures exercise the visual, kinesthetic nature of the hands, arms, and body to signify various actions, reactions, and objects and to enhance spoken messages. Deaf people born into situations where people are predominantly audio-vocal tend to quickly grasp the presence of gestures. There are inherent patterns that Deaf people internalize and build on to create their own systems of gestures leading to communication; such gestural systems are often referred to as "home signs." This creation has emerged because Deaf people's environments have provided input through gestures. By individuals' internalizing these gestures, combining them with personal experiences and connections with other people, a communication system emerges and is built.

The process of creating home signs through gestures has happened everywhere in the world since the beginning of Deaf people's presence in humanity. According to Plato in *The Cratylus*, Socrates said, referring to people in Athens, "Suppose that we had no voice or tongue, and wanted to communicate with one another, should we not, like the deaf . . . make signs with the hands and head and the rest of the body?" Socrates had noticed Deaf people using gestures—back in 350 BCE. Leonardo da Vinci discussed the gestures used by Deaf artists. In his 1798 biography of Leonardo, Jean Massieu wrote that prior to attending a residential school, he had used gestures and home signs, which were different from the signs used at school, with his Deaf friends, siblings, and other family members.[5]

Ivani Fusellier-Souza writes, "All sign languages currently used in the world have had the same starting point."[6] This starting point was the use of gestures, which then became home signs. As deaf people met one another, the gestures became an emerging sign language. Over generations of use, the emerging sign language became a signed language. This process of development, from productive signs to conventional signs, is typical around the world.

Deaf people have always been said to be visual and tactile people. George

Veditz, in a 1910 address, said that Deaf people "are first, last and of all time the people of the eye."[7] Obviously, our visual nature begins with language and its gestural origins, but there have to be other circumstances involved. Language has evolved, which has purposefully helped move the physical space of signing into a concentrated area of the body. In 1978, Robbin Battison studied Stokoe, Dorothy Casterline, and Carl Croneberg's 1965 *Dictionary of American Sign Language*. He discovered that out of 606 signs in the dictionary, some 465 signs were made in the facial area, whereas the others were made below the neck.[8] This indicates that signs have evolved over time to locations that provide clearer visual access. This, in fact, has happened time after time throughout history.

Nancy Frishberg's 1975 study shows different patterns of evolution toward symmetry. For example, in the old sign for RESIDENTIAL SCHOOL, the hands came together with the dominant hand's pinkie finger extended and the other hand in a closed fist. Over time, this has changed to both hands having an extended pinkie finger, creating symmetry (see Figure 14.1).

Figure 14.1. Older and contemporary forms for the sign RESIDENTIAL SCHOOL. Signed by Benjamin Bahan.

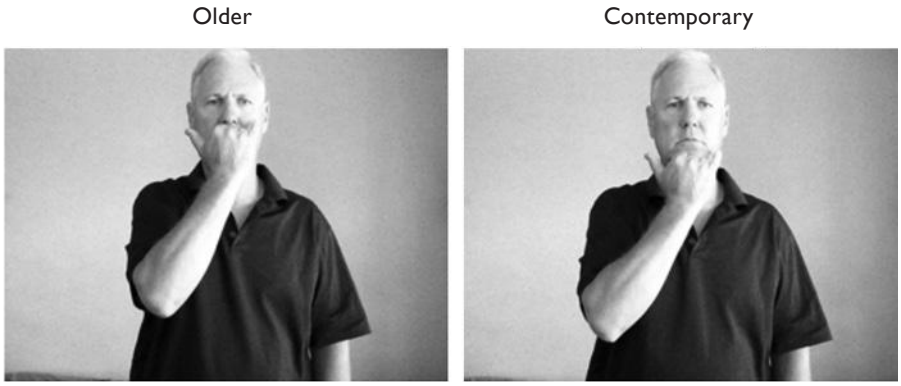


Figure 14.2. Older and contemporary forms for the sign WRONG.
Signed by Benjamin Bahan.

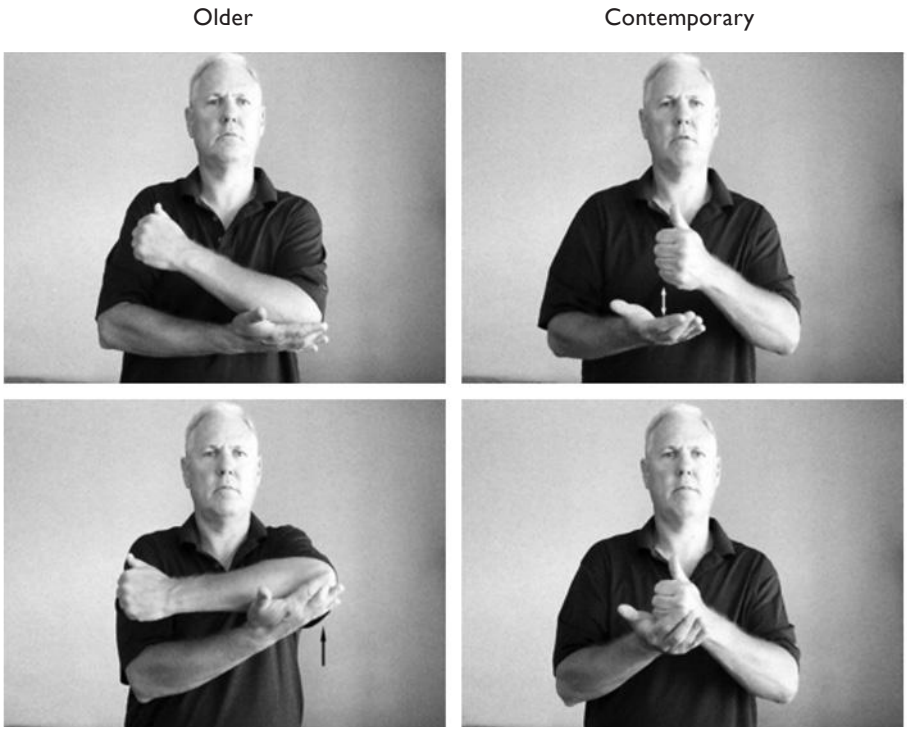


Figure 14.3. Older and contemporary forms for the sign HELP.
Signed by Benjamin Bahan.

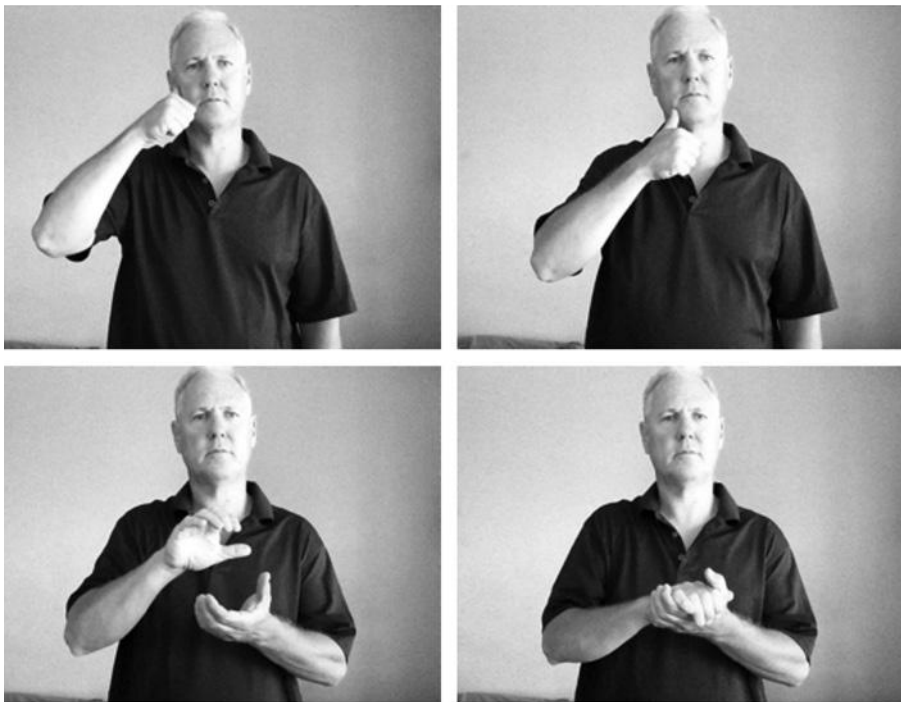
Other signs that obstructed the face have evolved, such as the sign for WRONG moving from the nose to the chin (see Figure 14.2).

The sign for HELP was once the nondominant hand "raising" the dominant elbow. This has evolved to the dominant hand bouncing on the nondominant hand (see Figure 14.3).

Symmetry, displacement, and centralization are all patterns in the evolution

of signs. Assimilation is another pattern, where two signs integrate to become one sign. An example of assimilation can be seen in WIFE, which has gone from being signed as GIRL-MARRY to being signed with one hand moving fluidly from the chin to clasp the other hand (see Figures 14.4 and 14.5). This pattern illustrates the tendency of signs to evolve for visual access, assimilation, and economy. Signed language is designed to ensure that signs are clearly visible.

Older Form



Contemporary Form

Figure 14.4 (*above*). Older form for the sign WIFE. Signed by Benjamin Bahan.
Figure 14.5 (*below*). Contemporary form for the sign WIFE. Signed by Benjamin Bahan.

Interestingly, when comparing the eyes and the ears in communication—specifically in the sending and receiving of messages—eyes can send and receive signals. The ears, however, can only receive signals, not send them. If ears were ever able to send signals, that ability has been lost through evolution. Because eyes can be used as a communication function within the visual-tactile orientation, the eyes have been embedded in different layers within the signal system in linguistics, ranging from morphology to syntax to discourse to narratives to social interaction. Thus, these different layers can be analyzed.

The use of eyes at different linguistic levels has been studied, such as in Charlotte Baker's 1976 and 1977 work discussing the use of eyes at a morphology level.[9] There have also been studies on the use of eyes at the syntax level. Dawn MacLaughlin in 1997 analyzed the use of eyes in noun phrases. In her study, she found that the eyes work in sync with pointing to help inform the listener of whether the speaker is referring to something specific or nonspecific.[10] In my 1996 study, I also examined how eyes may be used within verb phrases to express agreement.[11] For instance, in the sentence "John loves Mary," I could stand with John on my right and Mary on my left and replace these words with "(point right) LOVE (point left)." Suppose I say "(point right) LOVE." This leaves the listener wondering whom John loves. If I do not point to the other person, then that information must be replaced somehow. In this case, the eyes can help replace the dropped pointing: I can sign "(point right) LOVE" and glance to the left with my eyes. This glance now has the same function as pointing and allows the communication process to continue. There may be different interpretations or analyses of the data, but ultimately, the eyes have function in the language. Language utilizes the eyes to incorporate information in the communication process within sentences, grammar, and so on. For example, in the film *Signing Naturally*, Mary Teleford signs "CARE FOR" looking down.[12] The eye gaze demonstrates grammatically that the adult is looking at a child, and clearly shows the functional role eyes serve in grammar.

In discourse and turn taking, studies done by Charlotte Baker and Carol Padden showed the role that eye gaze plays in managing turn taking.[13] For example, when a speaker notes that the listener has raised his or her hand into the speaker's line of vision, this signals that the listener wishes to speak. There is much involved in the management of turn taking, including eye gaze and hand movement into the speaker's visual space. If a speaker does not want to allow turn taking to happen, such as during an argument, the speaker will deliberately not make eye contact with the listener. As a result, the listener will find it difficult to be given the opportunity to speak until eye contact is made.

Eye gaze and eye movement are prominent in narratives. One such prominence is in role shifting or character shifting. Analysis has clearly shown that the shifting of shoulders back and forth, along with eye gaze, serves a key role in identifying which character is speaking at which time. Now imagine that the shoulders

remain still but the head moves. If a signer repeats the same conversation with only the movement of the head and eyes, it continues to be unmistakable which character is speaking when. What if only the eyes move? The separation of characters still is effectively communicated as a result of the eye gaze shifting. Imagine that the eyes do not move but instead the signer uses the shoulders to role-shift. The entire conversation falls apart, because although the body may move back and forth, one cannot tell the separation of the characters. The eyes are a mandatory part of effective role shifting.[14]

Although in storytelling the storytellers have the floor, they still need to mind their gazes; if a storyteller's gaze stays in the story world for too long without making eye contact with the audience, the audience feels a sense of disconnection. Storytellers have to check in with the audience periodically to retain the audience's interest throughout the story. This periodic checking in entails eye contact in an almost formulaic, stanza-structured rhythm; it is a pattern of eye contact with the audience.[15]

Susan Mather's studies showed that a teacher's ability to utilize appropriate eye gaze in the classroom is extremely important for effective teaching. Some teachers who struggle with language also confuse and misuse two different kinds of eye gaze in the classroom. One is the I-gaze, or an individual gaze, and the other is the G-gaze, or a group gaze. A person who is unable to skillfully manage these gazes is likely to cause misunderstanding in the classroom. Mather cited an example in which a teacher who intended to address the whole class said, "I am really disappointed in you for not doing your homework." Because the teacher's gaze rested upon one student during this comment, the student, who had already done the homework, interpreted the message as directed specifically at him. The student responded, "But I've already done my homework." The teacher said, "No, I don't mean you, but I'm really disappointed." The student repeated his comment, and miscommunication took place again. This misunderstanding happened because the teacher utilized I-gaze instead of G-gaze, disrupting the classroom discourse.[16]

Clearly, eye gaze has a multitude of uses, from morphology to syntax to discourse and so on. The language users of the visual-tactile orientation have come to expound upon the use of eyes by integrating and developing eye gaze in all areas of communication. The uses for eye-gaze behavior expand into the realm of cultural behavior and belief systems. One of these areas is proxemics, or how people establish space among themselves. The space between two or more Deaf people is often linked to vision. At a loud, busy conference, for example, hearing people unable to hear each other clearly will move in closer to converse, whereas Deaf people tend to continue their conversation without a problem. Proxemics, then, is based not on sound but on the ability to see each other clearly.

The study of proxemics demonstrates that patterns exist. When two Deaf people converse and another person joins in, a triangle shape in the physical space will be created so that each person can clearly see the others. If another person

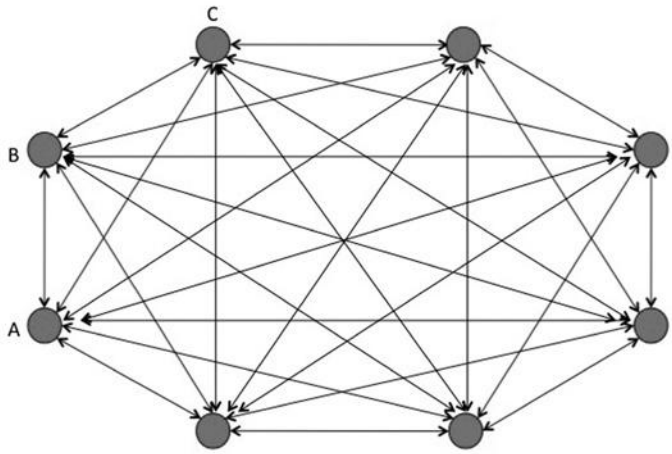


Figure 14.6. Circular proxemics. Conversation between two signers (A and B) begins with a straight line; when a third party (C) joins in, a three-way triangular conversation begins. Every new interlocutor maintains a triangular building block so that each person can clearly see the others. From Benjamin Bahan, "Sensory Orientation," *Deaf Studies Digital Journal* 1 (Fall 2009), http://dsdj.gallaudet.edu.

joins, the triangular space is still maintained. With each additional person entering the conversation, a triangle continues to be maintained. The entire conversational system is based on the ability to see one another. In Figure 14.6, we see that with an expanding group of people, the maintenance of the triangle shape is still there.

Another cultural behavior involves "reading the world." Numerous studies dating back to the 1980s show that Deaf people have increased peripheral-vision awareness. This is not to say that Deaf people see better than hearing people but rather to indicate that hearing people tend to pay attention to what is directly in front of them, leaving the responsibility of catching activity in their periphery to their ears. If they hear a sound to their right while looking forward, they will turn to see the activity. As studies show time after time, Deaf people's tendency to visually note happenings in their peripheral vision are heightened compared to hearing people.

I had a personal encounter with this reality. When my daughter Juliana was three years old, she and I were at a friend's house sitting at a table. I was seated between Juliana and the friend, and Juliana could see me from the side of her eye. The friend asked her who her preschool classmates were, and she started naming them. I tried to help her by mentioning one of the classmates, who had the name sign of a *K* shape, stroking the cheek downward. Juliana looked at me and said, "You're wrong! It's not like that, it's like this!" and she made the *K* shape

by stroking her cheek out to the side. At three years old, in the middle of a conversation, she caught my incorrect sign production in her peripheral vision. This shows that visual attention to the periphery among native signers begins at a very early age.

Deaf people learn to read the world for sound. Sound has a way of bouncing off visual cues. Say a Deaf person is walking somewhere and he notices several people looking in the same direction. He will know something is happening and will look also to see what the commotion is about. In other words, Deaf people can read sound. A great deal of reading-the-world activities occurs with lifelong practice, along with environmental feedback from adults. The idea of constantly being aware of one's surroundings is constructed by a visual way of being, and Deaf people often can look at a bustling area of people and identify which ones are deaf simply by noticing how they use their eyes in the world.

An essential Deaf cultural value is to share each other's sensory reach. Shared sensory reach is an embedded behavior, a norm, and an expectation of responsibility to share immediate sensory information, often when there's urgency. When two Deaf people are walking and chatting, each can see the space in front and to the side (periphery), but not behind. When they inform each other of what is happening behind the other person's back, the two individuals together have created a 360-degree sensory reach. Over generations, the culture has developed an expected behavior of sharing one another's sensory reach, especially as people walk together through a city. For example, if two people are walking together and one sees a pole, she or he will warn the other person in order to ward off a collision. This is an expected behavior even in many other places in the world. If this warning does not take place and the other person bumps into the pole, it is likely that the one who walked into the pole will ask, even angrily, why the other provided no notice. Such a violation of shared sensory reach happens frequently with Deaf and hearing pairs walking together, a clear instance of cross-cultural, or cross-sensory, conflict. Typically, the hearing person does not realize that he or she is responsible for informing the Deaf person of objects within the pair's sensory reach.

Robert Sirvage has found in his studies of Deaf people walking that there is a pattern in which a sort of imaginary axle maintains the space between them. If one person moves over, the other will by default move in the same direction yet maintain the same distance in space. In the moment that one in a pair notices something in his or her peripheral vision and moves to avoid it, proxemics dictate that the other will feel compelled to move as well to maintain that space between the two individuals. Studies show that Deaf people typically navigate together, effortlessly avoiding hazards, without any need to disrupt conversation, as a result of that imaginary axle between them with which they intuitively guide each other along the way.[17]

Another way Deaf people maximize their sensory reach is through pets or animals. For example, my family has a dog; we have always had a dog. My dog

gives me information about the environment around me. If my kids are upstairs at nighttime and I am downstairs watching television, my dog's sudden eye movement toward the ceiling tells me that my children are awake and moving around upstairs. When I go upstairs, my kids are often surprised and ask how I knew they were up. Pets or animals, among other tools, allow people to maximize sensory reach.

Values also relate to cultural beliefs and behaviors. Deaf people will hear the same phrase repeatedly growing up: "Be careful! Deaf people cherish their eyes!" If kids are playing in the sand and throw sand at each other, someone will inevitably tell them, "Be careful! Deaf people cherish their eyes!" I certainly heard that from my own parents as I grew up, and now I find myself telling the same thing to my Deaf children. This value has been passed down through the generations, illustrating how the eyes' value has been embedded in our cultural system. That again illustrates how the use of eyes is found within different layers in our culture, relationships, and values.

Within the arts, there is a wealth of cultural information expressed through art and literature, which we have learned a lot from. Other areas to look at are symbols and motifs. One motif that commonly appears in stories is related to doors and windows. One could say, "Doors are to hearing people as windows are to Deaf people." What does that mean? Hearing people can communicate through a closed door, but they encounter communication barriers with a closed window. The opposite is true for Deaf people: a door blocks communication, a window opens it.

The hearing community, for example, has knock-knock jokes: a person says "Knock-knock," representing a closed door, to which the response is, "Who's there?" and the joke continues. The Deaf community does not have knock-knock jokes; such jokes are meaningless. Yet the opposite happens with windows. For hearing people, a closed window leaves them stuck and unable to communicate; they usually will look for a door in order to communicate. If a Deaf person sees a closed door, he or she will look for a window to communicate through. This idea is mentioned in many literary forms. For example, the movie *This Is Spinal Tap*[18] is about British musicians who are trying to resurrect their career by coming to the United States to do a tour. While in a limousine, the driver starts a conversation with them about what kind of music they play. Upon finding out that they play heavy metal, he goes into his love for Frank Sinatra. The band members become bored and decide to shut him up by closing the window that divides them. The driver gets the hint and drives on. Interestingly, this scene shows a window as a mechanism to shut someone up, whereas Deaf people see windows as a mechanism to open the lines of communication.

Numerous works of literature include the theme of doors and windows. Ella Mae Lentz's poem "The Door" describes Deaf people with their hands chained together at school as they are forced to learn how to speak. They break free and

hide behind a closed door, which they board up and feel safe behind. Able to converse in sign language again, they feel free. Suddenly they notice the door vibrating; someone is banging on it. They start debating their next move. A hearing person would simply ask, "Who's there?" But since they're deaf, they can't do that. To find out who is at the door, they have to make a risky move: remove the boards from the door.[19] In this poem, the door holds a different, added meaning for Deaf people than it would for hearing people.

Figure 14.7. Harry R. Williams, *Coffin Door II*, 1989–90. Reproduced with permission from DawnSignPress.

At a small gathering with Boston University students in 1987, master storyteller Elinor Kraft told a story that involved a door and a window. One Deaf man on his way to work one morning turns back and finds himself locked out of the house. His Deaf wife is in a deep sleep and does not awaken to the flashing doorbell. The man sees an open window upstairs, so he grabs the hose and sprays water through it to wake his wife up. The idea of finding oneself stuck at a closed door and reverting to a window appears again as a way to get access. Many Deaf people, in telling personal narratives, tell about how they went to a Deaf friend's house, rang the doorbell with no success, and then spotted their friend by a window. They try to devise ways of getting access to their friend—through the window.

The same theme can be found in artwork. Take the painting *Coffin Door II*, by Harry Williams (Figure 14.7). With the information we have, an analysis of this painting identifies a meaning that is striking. There is a beautiful seascape blocked by a coffin door. The door is a barrier, but other objects lie beyond the door; there is a boat, and behind the boat is a window. That window leads to the city.

This analysis of vision and the role that eyes play in language, culture, art, and literature shows that vision is entrenched in Deaf people's orientation and pushes our senses to expand, but what about the tactile sense? Juhani Pallasmaa has said, "All the senses, vision included, are an extension of the sense of touch."[20] This means that touch is truly the most fundamental sense and the mother of

all senses. This is an interesting consideration to take into account, especially in regard to Deaf lives. Before we proceed into this idea further, let us analyze some of the perpetual myths that Deaf people face in regard to sound. For centuries, people have held on to the belief that Deaf people cannot process sound.

Sound travels in two ways: by air and through land, or vibration. Deaf people receive sound through vibration. A 1998 study by S. Levänen, V. Jousmäki, and R. Hiri showed that "the auditory system is well suited for the processing of vibrotactile information as auditory and vibratory stimuli are essentially similar temporal patterns."[21] In other words, heard and felt sounds are perceived and processed in the same area of the human brain. So, the notion that deaf people with severe hearing loss cannot process sound is misleading.

There are various studies related to Deaf people's visual nature, but substantially fewer studies explore the role of the tactile sense in culture, mental processing, and reception of information. This study focuses on two areas: feeling sound, and touch as belonging.

Deaf people raised in a native cultural environment start learning how to feel sound at an early age. Deaf people will alert children to feel and pay attention to sound, so children learn its importance in the same way the African person I interviewed learned about smelling danger. His environment and culture taught him to pay attention to certain details so that he could detect those cues himself, in the same way that the Deaf community and people who grow up in the culture encourage children to pay attention to sounds they can feel.

The role of touch and the feeling of sound is entrenched in many Deaf people's experiences everywhere. When I tell friends of a specific experience I had, they often say they also had similar experiences. When I was a graduate student, I went with a group of Deaf and hearing students to a bar. We chatted as the band played, and when the band went on break, the noise level decreased noticeably. My hands, lying on the table, felt a humming noise. I looked around, curious as to where it was coming from, and then asked my Deaf friend if he felt the same thing. He did, but also did not know where it was coming from. I decided to ask one of the hearing people in the group if he knew what it was, but he could not feel what I was talking about. I asked another hearing person, but he did not feel it either. Another Deaf friend felt it, and yet another hearing person didn't. It became evident that the Deaf people in the group felt the vibrations but none of the hearing people did. Did this mean the hearing people could not feel the vibrations?

In society, the discourse of sound revolves around measurements of hearing ability, such as decibels (dB). A deaf person with sensory-neural hearing loss of 120 dB in both ears is judged as being unable to hear a jet engine registered at 110 dB. As Jennifer Rosner states in the documentary *Through Deaf Eyes,* "Juliet failed the hearing screening in the hospital. They said she wasn't hearing up to 112-decibel levels, which means you could not hear a jet engine if you were next to it."[22] Standing next to a jet engine, I would be shaken by the sound. Or if a gun went off next

to me, I would unquestionably jump off the ground, because I can feel sound, especially in the 110–115 dB range. The construction of the ideology of hearing sound has undervalued the tactile feeling of sound. My experience in the bar made me aware of the difference between the way Deaf and hearing people differ in the development of sensitivity to and awareness of the link between touch and sound. Every two years, Gallaudet University hosts Rock Festival, a bash with blaring music, in an enclosed receiving dock located underneath a cafeteria. Sound in this space echoes off every wall and creates a sonorous cacophony. In addition, the feeling one gets in there is incredible. It becomes a "tactile party" where music is felt throughout the body. The value given to the feeling of sound is evident in the choice of that location for the festival; it is a place that maximizes the feeling of sound.

Several stories and themes related to feeling sound appear in different arts and literary media. There are many cultural practices in feeling sound through vibrations. This is deeply rooted in the visual-tactile way of being.

Touch as it relates to the notion of belonging is another intriguing area of analysis.[23] My discussion on this topic stems from a 2007 article by Hilde Haualand about the Norwegian word *gilhörigheg*, which means "to hear." Also contained in this word is the sense of "belonging," so that the word encompasses the combined notion of "to hear and belong."[24] The idea is that people who hear together feel connected and belong together; they share the same sensation. Recall from earlier discussion that touch and the sense of vibration are processed in the same area of the brain as auditory stimulation. I am led to think that with the sense of touch, the notion of belonging similar to *gilhörigheg* emerges. Belonging and presence go hand in hand.

How people touch, where they can touch, and how often they touch each other varies from culture to culture. A classic study by Sidney Jourard reports on the number of times couples touched each other within an hour inside coffee houses in different cities: San Juan, Puerto Rico; Paris; Gainesville, Florida; and London. In San Juan, couples touched each other 180 times. In Paris, they touched each other 110 times. In Gainesville, they did it twice. In London, couples did not touch each other at all.[25] The interpretation of touch across cultures is vastly divergent from place to place.

A number of Deaf people have talked about learning how to touch, how to get people's attention, and how different ways of touching may send out different sets of meaning. In one American Sign Language (ASL) curriculum, there is a video segment that explains one form of touch that conveys the message "Please move" without having to say anything. The situation involves trying to get across the room but being blocked by someone deep in a conversation. How do you make the person move without interrupting? The video explains how one should touch the person blocking your way. You should not make jarring taps on the shoulder to interrupt the conversation but, rather, gently press the person's shoulder in the direction he or she needs to move. That type of touch informs the person to move

over so that another may pass by without halting the flow of conversation.[26] Often, hearing people or sign-language learners will touch Deaf people in an incorrect manner, causing cross-cultural conflicts.

Differences between the way deaf people touch to get attention or to make a point and the meaning and allowance of touching among white middle-class Americans have caused problems and misunderstandings. In some cases, deaf people have even had to face legal action in relation to touch. A university professor took his kids ice-skating with a group of friends. At one point, a hearing kid came into the group and took one of the Deaf kids' balloon. The professor tried to talk to that hearing kid, but the child was inattentive. When he began to gently turn the kid by the shoulders so they could face each other to talk, the child's mother angrily came running over, saying, "Do not touch my child!" She called the police and filed assault charges against the professor. Even though the case was dismissed, that kind of brief contact with the child evolved quickly into a major misunderstanding. And that isn't the only time something like this has happened. In Florida, someone filed a same-sex-harassment charge against a Deaf coworker, because in order to be understood, he gestured and touched others too much. The court dismissed that case as well.[27]

Another situation relating to the issue of touch is recorded in the Scottish Parliament Official Report of September 18, 2002. The Parliament was faced with the issue of determining the kinds of touch that would be considered unlawful toward children, such as shaking harshly. Before the discussion started, at the opening of the parliamentary session, a Deaf preacher named Paul Fletcher presented a prayer in which he expressed concern that in the making of this law, Deaf people's touch could be misunderstood as harmful and that Deaf people could mistakenly have lawsuits filed against them. He asked that the Parliament be careful and make sure in its proceedings that Deaf people were protected, because society often misunderstands and misrepresents Deaf people's touch and actions. Here is an excerpt from his prayer: "As I am deaf, touch is important to me, as it is to many deaf people. Touch brings acceptance and reassurance. Deaf people are naturally tactile; their hands express and mean so much. Yet I am aware how easily touch can leave us feeling fragile. Naturally, all of us resist being vulnerable—so much so that we live in a society that is afraid to touch, afraid to reach out to help people in need and afraid that our gestures and actions may be misinterpreted or misunderstood."[28] Reverend Fletcher's concern that we live in a society afraid of touch is ingrained in arts and literature as well. In "The Sideshow," a sketch in the play *My Third Eye,* actor Patrick Graybill played a hearing person standing behind someone (presumably deaf) on a train, trying to ask that person to move aside so he can exit the train. When the person does not reply, he nervously taps the person's shoulder, which results in a startled response.[29] The whole scene is comical and projects a somewhat tongue-in-cheek mockery of hearing people's fear of touch.

Cultural knowledge and experiences with touch, combined with vision, that

are different from the mainstream form the visual-tactile orientation. This orientation is a culturally developed sensory way of being in the world, an embodiment in the ways of using the eyes, moving the body, engaging in dialogue, and touching and belonging. People who have grown up with this embodiment are naturally drawn to others sharing the same orientation and instantly connect with them. Even at international gatherings, Deaf people automatically feel connected to each other, finding that they mutually grew up as native members of the visual-tactile culture and feeling a sense of connection, a kind of synchronicity. Hearing people can be visual-tactile people as well. Many children of deaf adults have grown up in such an environment and have internalized the same orientation. It is a different way of being, in which different senses are prioritized.

Audio-Vocal Orientation

Again, the existence of two separate orientations is based on the way human languages are expressed. Signed languages operate on the visual-tactile orientation, whereas spoken languages use the audio-vocal orientation. Note that spoken language, or the audio-vocal orientation, certainly incorporates gestures, in much the same way that the visual-tactile orientation incorporates vocal aspects. Each orientation depends on the primary message and the mode of expression.

In this section of the chapter, we move on to examine the semiotics of the audio-vocal orientation, including how cultures—primarily American culture—give meaning to or interpret different noises and voices, and specifically how deaf people place their experiences in those cultures. We will accomplish this by analyzing deaf people's experiences, narratives, testimonies, and perceptions as they learn the meanings and restrictions of sound.

Voice and Identity

In cultures primarily oriented toward the audio-vocal, the human voice is highly valued and ingrained into the cultural ways of being. Personal information can be gleaned from voice alone. When one hears words in a person's voice, he or she can immediately detect that speaker's identity, character, personality, job, and much more—all ascertained from voice alone. Even a person's size, height, weight, age, race, gender, and sexual orientation may be determined, along with the speaker's intelligence level, education, societal class, quality of employment, and much more—all from the spoken word. The very minute a person speaks, his or her identity can be immediately revealed.[30]

To add to that, different vocal types and qualities exist. Even within a culture's "normal speech" range, irritating vocal qualities may be identified, such as nasal, high-pitched, or loud qualities. There is even a field of study that focuses on voices that deviate from the norm. Studies on speech disorders are aplenty. Anne Karpf reports that studies and literatures on speech disorders among schoolteachers go back at least thirty years, but almost none focuses on the vocal qualities among

teachers that have positive impacts that motivate learning.[31] Rather, the focus has been on what is *wrong*. Often, when a deaf person opens his or her mouth to speak, a disorder is immediately identified.

Voice tempo is another distinctive characteristic. In some areas of the world when someone speaks rapidly—for example, someone from New York—the person may be perceived as witty, smooth, and quick-minded. Those who speak slowly are perceived as dim-witted and slow-minded. Such perceptions are created based on the tempo of the speaker's voice.[32] This is another example of how the overall concept of personal identity is embedded in voice; it is one's voiceprint.

People even visualize what an unfamiliar person may look like while speaking on the phone. The person may sound tall, bright, and good-looking, sight unseen. One may be surprised to meet that person at the train station the next day and find the person to be short and chubby.

During the days when films began adding sounds, silent-movie actors had to go through voice testing or auditions to ensure that their voices matched their on-screen personae. One silent-movie actor in particular, John Gilbert, surprised many when they heard his voice for the first time. He often played a swashbuckling character, so filmgoers imagined his voice to be baritone—heavy, masculine. Even though filmgoers couldn't hear his voice, they gave his imagined voice a culturally constructed meaning. When people discovered that his voice wasn't quite what they had imagined, his career was never the same again.[33]

Voice alone provides a massive amount of information about people within a given cultural orientation. Given this fact, people often find it awkward to meet a deaf person, especially when accompanied by an interpreter. It is difficult for them to communicate knowing that the voice they hear is "ventriloquized" from another individual in another location.[34] This can become confusing, and the phenomenon is magnified when the hearing person constructs the deaf person's persona based on the interpreter's voice. Suppose this deaf person's deep sign elocution is represented by the interpreter's high-pitched voice. Visualizing a heavy signer as someone with a high-pitched voice does not "line up," creating conflicting experiences.

To top this off, when a hearing person encounters a "deaf-mute," he finds himself sensorially deprived from being able to use his culture's audio-vocal meaning system to establish the deaf-mute person's identity. This hearing person is left with questions like, how can I trust or know this person if I cannot decipher her identity? There may even be impressions of imbecility associated with being a mute.

Deaf Speech

Within the category of speech disorders is a subcategory, deaf speech. Deaf speech ranges from intelligible utterances to grunts and is differentiated from the normal-speech range. In 1975, Joanne Subtelney created a checklist that evaluated the speech abilities of students enrolling at the National Technical Institute for

the Deaf.[35] It identified deaf speech as often having nasal resonance and/or heavy breathing, being tense, and sounding high-pitched. Interestingly enough, these are almost identical to the vocal characteristics deemed irritating in the normal-speech range. Deaf speech at its best is irritating to hearing people.

Deaf people use vocalization for various purposes, from speaking to making vocal noises while engaging in physical or work-related activities. Some may not realize the meaning or message their voices send, whether it is humming or sighing. One winter while I was a graduate student, I showed up in class struggling with a cold and a cough. I didn't want my constant coughing to disrupt class, so I inhaled deeply every time I had the need to suppress a cough. Unbeknownst to me, the repeated deep breaths annoyed the professor, who turned to me suddenly and said, "I get your point," and looked away. I was perplexed. The interpreter quickly told me that it sounded as if I was sighing loudly to express that the lecture was dull. I was mortified, because that wasn't what I had intended at all. From sighs to hums to grunts, there are culturally established meanings for their uses in various discourse contexts that often create cross-cultural misunderstandings when produced in wrong places or times.

Grunts and Laughs

Deaf people some times grunt when they are engaged in conversations. Grunts are deep, guttural sounds, like the ones made by hogs. The phrase "grunt work" indicates work involving heavy lifting or work that does not require great skill. So, the cultural meanings of grunts get associated with people doing menial work and are not typically acceptable in spoken or aural culture except for a select few circumstances, such as weight lifting in the gym. Generally, they are not accepted in daily situations because of the meanings they conjure up in the hearer's thoughts. H-Dirksen Bauman shared his locker-room experience after a workout. There were rows of lockers, and as he changed clothes he heard two people in the next row grunt alternately. Had he not been aware of their being deaf, their grunts would have sounded as if they were fighting. He decided to check on them out of curiosity and found two deaf people of high status—one was a professor and the other an administrator—engaged in a deep discussion about politics. Their signs were profound, but their voices, or grunts, sounded as if they were fighting. Had he not been aware of the circumstances, he would have called the police to report a fight.

In many cultural situations, such as tennis, uncontrollable voices or excessive grunts are not acceptable. Professional tennis players such as Maria Sharapova, Rafael Nadal, Monica Seles, and Jimmy Connors have been known to grunt as they hit the ball during games. In fact, such grunts happen so often that the International Tennis Federation has recently begun to consider adding language to its code of conduct restricting grunts during tennis. A tennis club in Australia revoked a nine-year-old girl's membership because she often grunted while playing.

Cultural boundaries exist around the range of vocalization, a limited range of what is considered acceptable. Howard Dean, for example, attempted to become the Democratic candidate for U.S. president. At the 2004 Iowa caucuses, when he came in third in the presidential race, he gave a concession speech. He became spirited to the point where he began screaming beyond culturally established boundaries. People stopped what they were doing, stunned by how loud Dean was. His career potential of ever becoming president ended, all because of a single situation. People couldn't fathom how a person who exceeded vocal limitations could run a country.

Vocal excess and grunting, for many, have established meanings, and their implications for Deaf people are deep. Hearing people often think something is wrong when they meet Deaf people, but when they discover that people are Deaf, they almost always absolve the Deaf people of any apparent cultural missteps. Still, the initial reaction arises because their expectations aren't met.

Even the ways we laugh have culturally established boundaries. There are cultural controls for laughter, going from polite laughter all the way to a very strict cutoff point. If a person erupts into hysterical laughter, he or she will cover his or her mouth to muffle the laughter and reduce the noise level. Likewise, people comment on how deaf people's laughter is different. What do they mean by this? After all, laughter is natural. When we deaf people find something funny, we laugh—do we have to control that, too? This is astonishing. There are even instances where deaf people are taught how to laugh. Bernard Bragg told of his experience in class when he was a schoolboy. His teacher taught the students how to laugh, which is why Bragg's book is aptly named *Lessons in Laughter.*[36]

Control of Sound

Deaf people have scores of stories and testimonies cautioning each other in how to control sounds, because they learn that there are culturally established sound ranges one may produce without offending others. Sometimes in one place certain noises one produces are acceptable but the same noises are not accepted elsewhere. It becomes challenging knowing what noises are acceptable in what situations. This is part of the experience of being Deaf in an audio-vocal world.

As we have seen, from speech alone one can analyze the speaker's identity, character, intelligence, and other characteristics. Like voice, the noises one produces can allow a person to identify identity, character, and status. Control of sound in general is associated with socioeconomic status. Loud and rowdy noise is generally associated with the working class, and it still needs to be produced within a culturally acceptable range. As Deaf people learn about noises they make and what inappropriate noises are, they often share this information, such as in Angela Petrone Stratiy's 1999 videotape *You Think Deaf People Have Problems?*[37] In the video, Petrone Stratiy relates her experience with different noise-making materials, like the Styrofoam cup; she explains that if you break pieces off, this

produces an unbearable sound akin to fingernails scratching a blackboard. She goes on to discuss the noise produced when tearing different paper types and the speed they should be torn at.

Deaf people often unknowingly produce loud noises and become aware of their perceived loudness sometimes in a rude way. At times, hearing people's interpretations of deaf people's noises lead them to think Deaf people are angry. A common story shared by hearing children of deaf parents is the misperception their hearing peers have that their deaf parents are always angry, because they unknowingly slam cupboard doors and drawers and clatter silverware. This misperception stems from the hearing peers' cultural interpretations of noise-related behaviors that signal anger, happiness, and so on.

Control of Sound: Places

Places have rules for the control of sound. Libraries, for instance, expect people to be quiet. This is also true for movie theaters and churches. A deaf person may go into a church, see that everyone is quiet, and understand that quietness is expected. Yet he may pick up a book and thumb through the pages, not realizing that this makes noise. Once he is shushed, he may put the book away and feel obligated to stay still to avoid making noise. Or if she goes to the movies and eats popcorn, she may dig around at the bottom of the popcorn bucket only to discover that the loose kernels create noise. Deaf people learn about such noises by telling each other. Friends may share tips about noises we make and places or situations when we must be cautious about noises. A deaf person may think that in a football stadium or at a basketball game, given how fans scream at such events, he is free to scream as loud as he wants. Yet an acceptable range exists even for screaming. Hearing people have a cultural sensory knowledge of how loud a person can be in such situations.

Deaf people have to experiment with places and the specific vocal ranges allowed in them. They share their knowledge through testimony. When one exceeds cultural expectations, judgment and negative interpretations result—sometimes without a person realizing that such a judgment has been made. Let's use the toilet as an example. You cannot enter a bathroom and simply let loose, because this offends people. The bathroom is not necessarily a safe sanctuary, because when hearing people go into the bathroom, they can hear people in the other stalls. If a person is loud, the others think that person is mindless and has no class or manners. In some cultures, environmental noises must be created to conceal other noises. For instance, if one sits on the toilet to urinate, water or music must be turned on to drown out that noise, which is taboo to hear. Judgments are made even in the bathroom. In fact, judgments are carried into the bathroom. A colleague of mine at Gallaudet University shared that he could always identify who in the bathroom was deaf and who was hearing—all based on how they emitted waste. Hearing people are generally more cautious, whereas deaf people simply

do their business. What is the meaning of an individual who urinates without care? Cultural meanings associated with the control of sound are aplenty, so when a person does not control sound—regardless of the circumstances—this carries negative cultural implications.

Sensory Politics

When people accustomed to the visual-tactile way of life enter the audio-vocal world and inadvertently step outside of the acceptable range of behavior, they violate standards and create unintended meanings: they are loud, have no manners, and are barbaric. People interpret their noises as if they have something wrong with them, are slow-minded, or have no identity because they have no vocal skills. Through this judgment, we enter into sensory politics, where the dominant culture's sensory norms are imposed. When people are unaware of orientation differences and judge each other, a form of sensory politics is created.

Hearing people have often looked negatively at the sounds deaf people make that exceed acceptable boundaries, from speaking to producing environmental noises. Deaf people's lives and experiences of being pried, corrected, and forced into audio-vocal-oriented ways of being are evident in the setup of various social institutions (from medicine to education) that cater to this ideology. In discussing the uses of the senses in the modern world, many scholars in the field of cultural studies and visual studies often discuss the tyranny or hegemony of vision; Deaf people's experiences illustrate a stark contrast, suggesting that the hegemony of hearing appears to be more dominant.

Notes

1. E. T. Hall, *The Hidden Dimension* (New York: Anchor, 1982), 2.
2. Ibid., 1.
3. L.-A. Petitto and P. F. Marentette, "Babbling in the Manual Mode: Evidence for the Ontogeny of Language," *Science* 25 (1991): 1483–96; L.-A. Petitto, "On the Biological Foundations of Human Language," in *The Signs of Language Revisited: An Anthology in Honor of Ursula Bellugi and Edward Klima,* ed. K. Emmorey and H. Lane (Mahwah, N.J.: Erlbaum, 2000); W. C. Stokoe, *Language in Hand: Why Sign Came before Speech* (Washington, D.C.: Gallaudet University Press, 2001).
4. Stokoe, *Language in Hand.*
5. Jean Massieu, cited in H. Lane and F. Philip, ed., *The Deaf Experience: Classics in Language and Education* (Cambridge, Mass.: Harvard University Press, 1984).
6. I. Fusellier-Souza, "Emergence and Development of Signed Languages: From a Semiogenetic Point of View," *Sign Language Studies* 7, no. 1 (2006): 30.
7. G. Veditz, "The President's Message," in *Proceedings of the Ninth Convention of the National Association of the Deaf and the Third World Congress of the Deaf* (Philadelphia: Philocophus Press, 1912), 30.
8. W. Stokoe, D. Casterline, and C. Croneberg, *A Dictionary of American Sign Language on Linguistic Principles* (Washington, D.C.: Gallaudet College Press, 1965); R. Battison, *Lexical Borrowing in American Sign Language* (Silver Spring, Md.: Linstok, 1978).
9. C. Baker, "What's Not on the Other Hand in American Sign Language," in *Papers from the Twelfth Regional Meeting, Chicago Linguistics Society*, ed. S. Mufwene, C. Walker, and

S. Steever (Chicago: University of Chicago Press, 1976); C. Baker, "Eye-Openers in ASL" (paper presented at the California Linguistic Association Conference, San Diego State University, 1976); C. Baker, "Regulators and Turn-Taking in American Sign Language Discourse," in *On the Other Hand: New Perspectives on American Sign Language*, ed. L. Freidman (New York: Academic Press, 1977), 215–36.

10. D. MacLaughlin, "The Structure of Determiner Phrases: Evidence from American Sign Language" (PhD diss., Boston University, 1997).
11. B. Bahan, "Non-manual Realization of Agreement in American Sign Language" (PhD diss., Boston University, 1996).
12. *Signing Naturally: Level 1 Student Videotext,* directed by C. Smith, E. M. Lentz, and K. Mikos (San Diego: DawnSignPress, 1988), VHS.
13. C. Baker and C. Padden, "Focusing on Nonmanual Components of American Sign Language," in *Understanding Language through Sign Language Research*, ed. P. Siple (New York: Academic Press, 1978), 25–57.
14. B. Bahan and L.-A. Petitto, *Aspects of Rules for Character Establishment and Reference in American Sign Language Storytelling* (La Jolla, Calif.: Salk Institute for Biological Studies, Neurolinguistics Laboratory, 1980).
15. S. J. Supalla and B. J. Bahan, *Bird of a Different Feather and for a Decent Living* (San Diego: DawnSignPress, 1994).
16. S. A. Mather, "Eye Gaze and Communication in a Deaf Classroom," *Sign Language Studies* 54, no. 11 (1987): 30; S. A. Mather, "Visually Oriented Teaching Strategies with Deaf Preschool Children," in *The Sociolinguistics of the Deaf Community,* ed. C. Lucas (San Diego: Academic Press, 1989), 165–87.
17. R. Sirvage, "Navigational Investigation on Walking Signers" (master's thesis, Gallaudet University, 2010).
18. *This Is Spinal Tap,* directed by R. Reiner (Embassy Pictures, 1984).
19. E. M. Lentz, "The Door," *The Treasure: ASL Poems by Ella Mae Lentz,* directed by L. C. Taylor (Berkeley, Calif.: In Motion Press, 1995), DVD.
20. J. Pallasmaa, *The Eyes of the Skin: Architecture and the Senses* (West Sussex, UK: Wiley, 2005), 42.
21. S. Levänen, V. Jousmäki, and R. Hari, "Vibration-Induced Auditory-Cortex Activation in a Congenitally Deaf Adult," *Current Biology* 8, no. 15 (1998): 871.
22. *Through Deaf Eyes,* directed by D. Garey and L. Hott (Washington, D.C.: WETA and Florentine Films/Hott Productions), televised by WETA on January 10, 2007.
23. The information presented here is the result of a personal conversation with Hilde Haualand and Gene Mirus.
24. H. Haualand, "Sound and Belonging," in *Open Your Eyes: Deaf Studies Talking,* ed. H-D. Bauman (Minneapolis: University of Minnesota Press, 2007).
25. S. M. Jourard, "An Exploratory Study of Body-Accessibility," *British Journal of Social and Clinical Psychology* 5 (1966): 221–31; S. M. Jourard, *Disclosing Man to Himself* (Princeton, N.J.: Van Nostrand, 1968).
26. Smith, Lentz, and Mikos, *Signing Naturally.*
27. "Twenty Hugs over Seven Years Not Harassment," *Hospital Industry Quarterly: Labor and Employment Law Report* (Summer 2002): 4.
28. P. Fletcher, Scottish Parliament Official Report, September 18, 2002, retrieved from http://www.scottish.parliament.uk.
29. "The Sideshow," *My Third Eye,* directed by D. Miles (New York: PBS, 1973), television broadcast.
30. A. Karpf, *The Human Voice: How This Extraordinary Instrument Reveals Essential Clues about Who We Are* (New York: Bloomsbury, 2006).
31. Ibid.
32. Ibid.

33. Ibid.
34. H-D. Bauman, "'Voicing' Deaf Identity: Through the 'I's' and Ears of an Other," in *Getting a Life: Everyday Uses of Autobiography*, ed. S. Smith and J. Watson (Minneapolis: University of Minnesota Press, 1996), 47–62.
35. J. Subtelney, "Speech Assessment of the Deaf Adult," *Journal of the Academy of Rehabilitative Audiology* 8 (1975), available at http://www.audrehab.org/.
36. B. Bragg, *Lessons in Laughter* (Washington, D.C.: Gallaudet University Press, 1989).
37. *You Think Deaf People Have Problems?,* directed by R. Day, produced by A. Petrone Stratiy (Edmonton, Alb.: Deaf Utopia, 1999), DVD.

15

THE DEAF GAIN OF WLADISLAV ZEITLIN, JEWISH SCIENTIST AND INVENTOR

MARK ZAUROV

As fundamentally visual people, Deaf inventors have a different approach to the world that surrounds them than their hearing colleagues. This visuality consequently defines their inventive creativity at the service of everyone—Deaf and hearing. Precisely because he was Deaf, Wladislav Zeitlin had a drive to invent and to construct a device that would respond to his dominant sense of perception and that would also satisfy other Deaf people: television. At the same time, he was very well aware that this new technology would offer extremely diverse possibilities for usage in various technical fields.[1] Around 1922, at a time when the field of television was in its infancy and when scientists working on electronic-wave transmission were hardly prepared for such innovations, Zeitlin began to work on the transmission of moving images or "live pictures," as they were called at the time, based on electronic principles.[2] In 1924, after about two years of intense theoretical study, he developed several modifications of a completely new television apparatus intended for the transmission of moving images. These pioneering achievements, eight altogether, were patented in the German Patent Office in Zeitlin's name. At this time, Wladislav Zeitlin was seventeen years old. Until his untimely death, in 1944, he would hold patents in television technology in several countries (Germany, France, and England), be a role model for the Deaf community (already famous in his lifetime, Zeitlin was portrayed in the film *Verkannte Menschen* in 1932),[3] and be admired by his teachers and colleagues, including the prominent physicist Albert Einstein.

However groundbreaking, Wladislav Zeitlin's achievements do not stop at his technical innovations. He was a well-educated man who read incessantly and philosophically dwelled on whatever attracted his attention. His autobiographical and philosophical writings take us by the hand to lead us to the source of his visual creativity. When we understand why Zeitlin's ideas are Deaf ideas, we understand another instance of Deaf Gain.

"Pathbreaker of Higher Education of Deaf Students": Zeitlin's Biography and Education

Wladislav Zeitlin was born in 1907 in Tbilisi, Georgia, to a family of the intellectual Jewish bourgeoisie: his father, Apollinar Zeitlin, was a lawyer, and his mother, Rosalie Matrosowitsch, was a professional singer and a virtuoso pianist. During the Weimar Republic and the beginning of Hitler's rule, the family lived in Berlin, Germany. In 1922, Zeitlin was accepted into the prominent Israelitische Taubstummen-Anstalt in Berlin-Weissensee (Israelite Institution for Deaf-Mutes, or ITA). There the eager student met the exceptional deaf pedagogue Dr. Felix Reich, who was to become his teacher, mentor, and friend.

With Reich's support, Zeitlin was able to obtain exceptional access to higher education, which had previously been closed to Deaf students. In 1925, Zeitlin was the first Deaf person to graduate from the German Realgymnasium (academic high school). After his graduation, two classes for Deaf students were established, allowing them to study for two additional years to obtain a continuous higher education.[4] His success proved the undeniable intellect that was dormant in Deaf students, and he was used as an example to gain exceptions for others.[5] In November 1931, Zeitlin passed his exam at the Royal Technical College of Charlottenburg (today known as the Berlin Institute of Technology) and became professionally qualified as an engineer. The "pathbreaker of higher education of deaf students," as Zeitlin was praised in *Das Band*, the journal of the Deaf Jewish community in Germany, became a role model for many deaf students.[6]

Figure 15.1. Wladislav Zeitlin (*right*) with Felix Reich, the principal of the Israelite Institution for Deaf-Mutes (ITA). In 1925, Zeitlin was the first Deaf person in Germany to graduate from the Realgymnasium.

The circumstances of Zeitlin's death remained unclear until recently.[7] We can assume that he lived in Berlin until 1934 at the latest, then moved to Paris. Serge Klarsfeld's *Hommage à trois scientifiques juifs déportés de France* shows that Wladislav Zeitlin was working in the Boulogne Seine, a northern suburb of Paris, together with three other scientists: Ayzyk Gorny, Xenia Gourvitch, and Feodora ("Fenia") Rabinovitch.[8] All were deported, and two survived. The archivist Karen Taïeb writes that Zeitlin was interned in the camp of Compiegne and liberated from this camp in November 1941.[9] There is no information on why he was jailed and released. It is also not clear whether he had joined the Resistance. On July 16, 1942,

he was arrested again during the famous Rafle du Vélodrome d'Hiver, jailed in the camp Drancy, and deported to Auschwitz on July 19.[10] Train convoy 7 arrived on July 21, 1942, and carried one thousand Jews; only seventeen survived in the end.[11] Zeitlin died in Auschwitz at the age of thirty-five.

"Vision Broadcasting Analogous to Sound Broadcasting": Zeitlin's Inventions

According to his own words, Wladislav Zeitlin continued the work of Hertz, Marconi, and Popov, the distinguished scientists and engineers of that time who developed radio equipment and proved that one could produce and detect electromagnetic radiation, now generally known as radio waves.[12] The development of the radio had started as "wireless telegraphy," triggered key inventions such as the telegraph and the telephone, and led to today's wireless technologies.[13] The radio was not the result of one single inventor's labor; neither was television. Zeitlin's imagination had been sparked with the notion of sending moving images wirelessly or, in his words, "vision broadcasting analogous to sound broadcasting."[14] He wrote, "I managed to find an apparatus that makes it possible to see on a plate, located in Hannover, for example, how we are sitting around here in Berlin and how we move."[15]

In his description of his television apparatus and the related patent applications for several television modifications, seventeen-year-old Zeitlin explains, in a well-defined and precise manner, why no one before him had tackled the challenges involved: his predecessors had tried to achieve transmission via mechanical means but, as he formulates further, no such mechanism could have possibly achieved the velocity necessary for visual transmission.[16]

Then Zeitlin proposes practical modifications of the television apparatus,

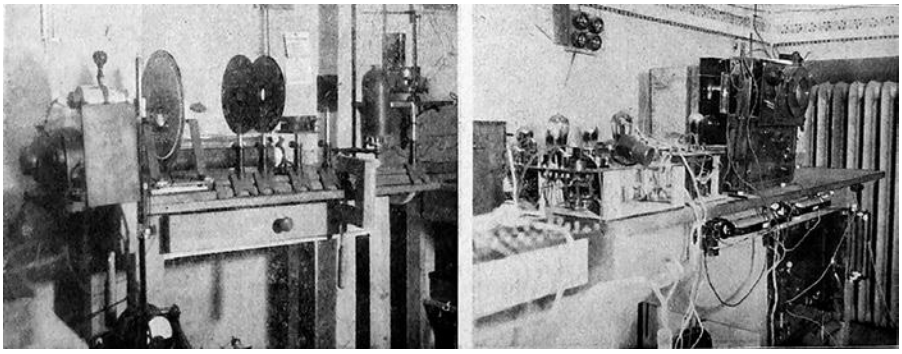


Figure 15.2. The electrotechnical laboratory of Wladislav Zeitlin in Berlin-Weissensee, where he researched the transmission of the motion picture in the electrical field. *Left:* Several apparatus for photoelectric measurements. *Right:* Equipment for the visual reception of "live pictures."

including the idea that electrons produced by the Braun oscillograph be used for the desired transmission. The sender and the receiver work simultaneously, and the signals are transmitted via electric signals. The sender's oscillograph is placed behind a screen onto which a picture is projected. The light on the screen triggers secondary electrons inside the oscillograph, the number of electrons being equivalent to the intensity of the light. These signals are amplified and transmitted to the receiver, built almost identically to the sender. Here, the cathode emission hits a fluorescent screen, producing light. A grid carrying the sender's signals about light and dark areas is placed right before the screen so that still images are reproduced fast enough to deceive the viewer's eyes into believing that the images move. Zeitlin's language is very clear and easy to follow, and the idea as such is, according to his colleague Albert Einstein, brilliant.[17] Accordingly, Zeitlin shortly received several positive evaluations from the German scientists working in the field without any theoretical objections.

Zeitlin was well aware of the enormous scope and potential of his invention. From his list of implementations encompassing all areas of life, we can see that, for him, television was much more than just an extension of the cinema. It would be a medium for mass communication, as easy to use as a telephone: it would send and receive visual messages. His vision goes far beyond the consumerist use of television as we know it now. Rather, he was thinking of, for example, a videophone. His vision laid a stress on active communication as we are experiencing it with the Internet today: hence his comparison with the telephone.[18] It would be indispensable for the commercial exchange of stocks and goods, invaluable in times of war, and elementary for educational purposes, and it would allow journalists to send and receive visual material quickly. The scope of Zeitlin's invention goes beyond replacing purely audible information technology. He saw the truly innovative aspect in the transformation of all kinds of invisible radiation into discernable images: The captain of a ship would safely follow his route on a screen, with no need for a compass, sextant, or other distractions. The mining industry would map on a screen mineral deposits hidden deep inside the earth. The possibilities were limitless.[19]

Even though Zeitlin became one of the first inventors in Germany in the field, proposing and patenting eight television systems and managing to sell some of his patents, his name does not appear among the internationally prominent inventors of television. In his *History of Television*, Albert Abramson briefly mentions Zeitlin for his invention of "a combination camera and receiving tube in the same envelope."[20] We must dig further for his proper place in TV history.

Zeitlin developed further patents in France. The patent applications listed in Klarsfeld total thirty-three.[21] What happened to the whole of the income from the French patents is not known.[22] The detailed patent 802.004 of May 9, 1935, shows his name together with that of his father, Apollinar Zeitlin, and that of Vladimir

Kliatchko.[23] In addition to Zeitlin's holding patents in Germany and France (from 1935), Klarsfeld lists an additional country: England.[24] Zeitlin died before the first 625-line television standard was designed in the Soviet Union, in 1944.

Wladislav Zeitlin's Deaf Colleagues
T. A. Edison and K. E. Tsiolkovsky

In contrast to Zeitlin, the inventors Thomas Alva Edison (1847–1931) and Konstantin Eduardovich Tsiolkovsky (1857–1935) became deaf later in life. Tsiolkovsky was speaking Russian when he became deaf at the age of eleven; Edison was speaking English and was twelve years old. Each had fully acquired a spoken language that shaped his cognition and rooted him in what Zeitlin would call an "auditive psyche."[25]

Among Tsiolkovsky's more than five hundred publications, including one hundred books he wrote about space and rocketry, there is very little mention of his deafness.[26] Nonetheless, his statements are very poignant in describing his escape into "Free Space" from the extreme "isolation," social "torture," and "humiliation" his deafness inflicted upon him.[27] Space technology and astronautics were his chance to excel and to shake off humiliation. The celebrated "deaf prophet of space travel" came up with the blueprint for the rocket-powered spaceship.[28] There was no immediate use of his inventions to improve the life of other Deaf people. Even if his deafness may have driven him into imagining trips to Mars and endowed him with the necessary solitude and concentration to be creative, Tsiolkovsky's ambition was to overcome it in order to live up to audistic criteria of being fully human.

Edison's views on his deafness have been the subject of abundant interviews and scholarship. The physician Harry G. Lang postulates that Edison's activity as an inventor was prompted by his deafness. Edison clearly stated that his deafness was not a handicap for him but, rather, a benefit.[29] As a Deaf person, he went on, it was easy to achieve "intensive thoughts and concentration."[30] By hearing nothing, Edison was able to avoid the distractions and the noise that functioning auditory organs would have exposed him to. However, these "intensive thoughts" proliferating in silence would be subject to an auditive cognition because of his early socialization in spoken English. The positively framed solitude was no more than the flip side of the social isolation embedded in the view of deafness as a deficiency. The same applies to Tsiolkovsky.[31]

Edison worked in the field of acoustics. Acoustics is not accessible for Deaf people, as Zeitlin points out.[32] Frank Howe, a member of the contemporary Deaf community, claimed that Edison was hard of hearing rather than Deaf. Howe complained that if Edison were Deaf, he would have come up with inventions more useful to the Deaf community than the phonograph.[33] Indeed, other Deaf inventors Lang mentions did serve Deaf purposes with their inventions, offering

benefits to hearing users as well. For example, William E. Shaw solved problems faced by Deaf users by inventing the "Baby-Cry" signaler and the "Bell-less" doorbell.[34] In rebuttal to Howe, it has to be pointed out that Edison did invent the kinetoscope, entertaining the eye with motion pictures just as he did with the ears with music from a phonograph.[35] A kinetoscope was designed for only one viewer, who watched moving images through a peephole. It paved the way for cinematic projection, extraordinarily beneficial for Deaf audiences, given that the films produced were silent. Lang stresses that, after the advent of talkies expelled Deaf audiences from the movie theaters, Edison called for the invention of an "apparatus . . . [for Deaf viewers] to enjoy motion pictures again" and made "Talkies for the Deaf," a precursor of captioning.[36]

Whereas the scarcity of information regarding Tsiolkovsky's view of his deafness leads us to the conclusion that he viewed his deafness as an overall burden, even though he was able to find a way of turning the curse into a blessing by choosing the socially prefigured role of the outcast, mad, and at times mischievous genius, the abundance of information about Edison allows for an ambivalent identity between "hard of hearing" and Deaf.[37] In contrast to both Tsiolkovsky and Edison, Zeitlin, being born Deaf, holds up a fiercely positive sociological view of his deafness: he apprehended his deafness as the "sensation of difference in cognition and perception."[38] In retrospect, Zeitlin owed his wholesome self-respect to the unconditional impartiality of his mother, who, he wrote, "constantly talked to me as if I were a normal child." Moreover, he stresses that he had never suffered physical abuse.[39] His mother had provided him with a protected, innocent space in which all possibilities of life were open and within which he could, in his own words, "bring my eyes to perfection."[40] A close look at his own writings about the interrelation between his deafness and his inventions shows us that, in his own understanding, his creative intellect was deeply rooted in what he called visual culture and cognition.

"I Do Not Consider Deafness as a Deficiency": Zeitlin's Essays

Wladislav Zeitlin's philosophical thoughts about his Deafness, visuality, and visual thinking deserve special attention. They are formulated in his 1927 set of essays, one of which is titled "How Do I Sense My Deafness?" He begins this essay with a strongly assertive statement about himself as a human being, revealing a social approach to deafness instead of a medical one:

> I must remark on the fundamental fact that I have been Deaf since my birth. Yet, I lack the sensory perception to notice that one of my organs does not function. When interacting with strangers, I am under the impression that they are creatures, different from myself; it is, as if they were Martians, or better yet, as if I were a Martian myself, who has shown up on earth by accident. . . . I remember having a conversation with my zoologi-

> cal teacher from Russia who taught me about atavism. I had asked her if it could be possible that the whole of humanity would become deaf because I considered the sense of hearing as something nearly useless. This may serve to illustrate how strongly I do not consider Deafness as a deficiency.[41]

Just like Tsiolkovsky, Zeitlin felt so disconnected to his social environment that he would rather find a sense of belonging somewhere away from earth, on another planet. This common association points out that the sense of belonging to human beings per se was at stake. Unlike his colleagues, however, Zeitlin took it for granted that he was a completely intact being and that therefore Deafness was not a deficiency. On the contrary, he attributed the deficiency to those who could hear. Referring to a zoologist, a nonanthropocentric scholar, he claimed that the sense of hearing was an "atavism," that is, a superfluous organ, useless for survival. Zeitlin did not need any prostheses to learn many languages or to develop his patents. Even though the young Zeitlin was brought up to read lips, he developed what he called a "visual psyche."[42]

"Take Cinema Home": Zeitlin's Focus on Visual Communication

Zeitlin's essay about theater, "How Do I Benefit from Theater?," tells us about his motivation to invent television. An avid participant in cultural life, Zeitlin found that for a deaf spectator, theater is "boring": the gestures seem mechanical, "shallow," and "grotesque," because the spectator is too far away from the actors' faces, and the plot is "disappointing" and not discernable because of the less-than-perfect illusion created by the props and costumes. Watching a play, the spectator sees "a series of illuminated moving images without explanation."[43] Only the perfect illusion of cinema, he wrote, can capture a deaf audience's attention, by "1. The facial expressions of the actors, 2. The vividness of the plot, 3. Natural stage décor."[44] As talkies were just about to replace silent films around the time his essay was written, Zeitlin was referring to the aesthetics of silent movies. The invention of television would "mean that theater and cinema enter people's homes and permeate everyday life."[45] These lines reveal that Zeitlin's zest for creating a visual mass medium to take cinema "home" derives from his own desire for participation in a culture that excluded deafness. His invention, as a consequence, would benefit not only those who cannot hear but also all those who can see. His vision prefigured a paradigm change the depth and scope of which we are able to grasp only today, after the end of the television era and the onset of the Internet.

Visual communication, for Zeitlin, was not restricted to technology. He was interested in visual communication as *Kulturtechnik*. Bernard D. Geoghegan introduces this particularly German idea mainly based on Friedrich Kittler and Marcel Mauss: "[T]heorists of *Kulturtechnik* have developed a non-anthropocentric epistemology that is equally attentive to the role of human techniques and material technologies in constituting cultural form and practice."[46]

"Face Language": Zeitlin's Prefiguration of Sign Language as *Kulturtechnik*

In a complex part of his vital linguistic essay titled "The Advantages and Disadvantages of Sign Language," Zeitlin calls sign language a natural and conventionalized "language of the eyes."[47] Although he picked up signing later in life, he was said to be a proficient signer.[48] In this essay, Zeitlin systematically outlines the vast potential of sign language. His analysis is so radical for the times that he faced disbelief even from his mentor, Felix Reich. Zeitlin writes, "The only disadvantage of the language of the eyes is constituted by the conflict with its environment, i.e. with hearing people and their way of thinking."[49] He attributes this conflict to the conceptual elaboration of spoken language in self-referring concepts that are impossible to understand for visual people. Nevertheless, in the use of sign language, he wrote, "For me, all auditive concepts fall away."[50] Zeitlin is calling for a progressive fine-tuning of sign language that strives to overcome this cultural conflict by loosening its tie to iconicity and pantomime and by elaborating instead on its nonmanual markers and incorporation of auditive terms into the conceptual vocabulary. This is what he calls "face language united with voice language."[51] This view was largely misunderstood by Reich, who was involved in the writing process of the essays and may have controlled the texts to a certain extent.[52] Reich could not restrain himself from entering a footnote saying it is far-fetched to consider facial movements as constitutive parts of sign language.[53] The bilingual education activist Reich took from Zeitlin that the use of the hands for signing was "primitive" and that deaf people should use their voices.[54] Other contemporaries used the same essay as an advocacy of bilingual education.[55] Since then, linguists of sign languages have discovered the existence of nonmanual markers. Zeitlin counted twenty-five individual facial movements and identified them as linguistic parameters to be combined freely, just like the alphabet of twenty-six letters, to enhance sign language's capability for abstraction and to enable its use just like writing. Zeitlin wrote that these nonmanual markers could be used like the facial movements hearing people make while speaking.[56] The incorporation of spoken languages has also been identified by linguists today in, for example, finger spelling. Thus, Zeitlin's *Gesichtssprache* can be understood as the intensive use of signing as a cultural technique—just like writing—performed by the human body.[57]

The difference between visual and auditive cognition is delineated in Zeitlin's essay "How Do I Think?" He defines thinking as fantasy, memory, and logic.[58] Visual thinking, he postulates, fills concepts with visual (as opposed to auditive) vividness and leads to a new set of associations.[59] He comes to the conclusion that all levels of abstraction gain meaning through experiences by way of a person's sensory perceptions, but the highest insubstantial concepts, like mathematics, draw their meaning from the soul. This soul, in turn, invests the other levels with

meaning.[60] Zeitlin refers to the German enlightenment philosopher Immanuel Kant's distinction of "phenomena" and "nuomena" as defined in his *Critique of Pure Reason*.[61] Phenomena are objects that can be known by way of our senses; they are the perceivable manifestations of nuomena, the things-in-themselves. The latter ultimately evade our knowledge; we can only approximate them by contemplating the interrelations of the categories of our understandings and our perceptions.

As Reich clearly states in the foreword to Zeitlin's essays, Zeitlin's insistence on having a soul has to be regarded as a reaction to the audistic claim that deaf subjects do not have a soul and therefore are not human.[62] The final words of his essay on sign language are these: "In conclusion, one may say that face language united with voice language, i.e. spoken language, returns Deaf people to the world after their exile by birth and destiny."[63] Zeitlin's writings reintroduce him to human society, yet only after they have changed this society's underlying values using *Umwertungsarbeit,* the incessant labor of translating auditive concepts and values into visual ones.[64]

Umwertungsarbeit: Zeitlin's Humanism

As I pointed out before, Zeitlin was acutely aware that he was living in an audist society depriving him of his humanity. In his essay "How Do I Sense My Deafness?," not only does Zeitlin perform the proof of his humanness by conclusively reasoning about abstract ideas in written German but, in a rhetorically complex series of antitheses and parallelisms, he also philosophically positions himself beyond a deaf–hearing dichotomy as a follower of Immanuel Kant's rigorous humanism.[65] Electricity, Zeitlin writes here, is his own "music," a source of his creativity.

Sarcastically comparing himself to a Martian, Zeitlin cognitively distinguishes "visually wired" people[66] like himself from "auditive" (that is, "musical") ones. He stresses the incommensurability of this difference by pointing out that, even though he could communicate with auditive people, he could not understand their psyche; any attempt to rationally explain it objectifies it and pulls it further away from his grasp.[67] He attributes this cognitive gap to his inability to truly *experience* music; he could learn about music, he could deduct it from mathematical principles, he could experience harmony, timbre, rhythm, and meter in other visual and tactile art forms just as well, but in the end, acoustics would remain an abstraction. "Electricity," he writes, "is the same to hearing persons as sounds are to me." For others, Zeitlin postulates, electricity is an ungraspable abstraction. He goes on: "The similarity is far reaching; the propagation of the sound is just as unnoticeable for me as the propagation of electromagnetic waves is for others." Zeitlin sets up an equation of both the eugenic and the audistic reference frames in theorizing what makes a human being. He inverts the idea of deficit into one of abundance: "[T]he more languages you speak, the more human you become," and "the more sensory organs you have at your disposal, the more human you are." He

inserts his simile of music and electricity, both of them quantifiable phenomena of propagating waves in space, into the first equation. As a result, the reader cannot deny that the reception of the "psyche of electricity" requires a "sixth sense."[68]

Although it perfectly makes sense to see electricity as Zeitlin's creative element, it would be reductive to state that, alas, he managed to replace one sense with another. It is not electricity or music that ultimately matters. What makes Zeitlin a virtuoso is what he calls *Umwertungsarbeit.* Literally "re-valuation-labor" is the performance of waves in different elements: as sounds, as moving images, as electricity.[69] A poignant example is provided in diagrams transposing his bodily sensation of his own speech as time (on an x-axis) versus intensity (on a y-axis).[70] He concludes that sounds are not physiological but rather physical, drawing the very phenomenon of sound into his realm of physics by way of a visual representation.[71] In a similar way, the whole series of essays as a contemplation of his own sensory processes is a product of this labor. Zeitlin refers to this work as the result of a metasense, "the sensing of the senses."[72] This concept is, once again, derived from Immanuel Kant. The Kantian idea of reason is given as an inner sense that orders the senses tuned toward perceiving the outer world.[73] It is a kind of reason beyond the clash of deafness and hearing that places Zeitlin, and his readers, into a philosophical and human frame where they can meet eye to eye: "This 'meta sense' [*Uebersinn*] allows me to feel as a member of humankind."[74]

"My Part from Life": Zeitlin's Deaf Gain

On his last postcard, to Fenia Rabinovitch (who was in Paris), dated July 14, 1942, Wladislav Zeitlin wrote about the increasing difficulties he was encountering in work on his own research and his desire for recognition: "My work is becoming more interesting. The increase of personnel at the company makes it more difficult for me to do my own work since my laboratory has to accommodate everybody. . . . I am also saddened that my recent work remains anonymous. I would like to get my part from life after such long and exhausting labors."[75] Against all the odds in an anti-Semitic and audist world, Zeitlin developed a positive self-perception and could unfurl his linguistic and scientific genius. It is tragic that his young death in Auschwitz put such an abrupt end to his series of inventions and writings. It is up to us to imagine what today's world would be had he realized the inventions he envisioned. Zeitlin's Deaf Gain comes to us via the epistemological circuit of nonanthropocentric, and therefore limited, ways of knowledge, never able to fully know things-in-themselves. As a passionate physicist and electrotechnician and as the engineer of new cultural techniques, Zeitlin designed an innovative visual mass-communication device and pointed toward sign language as a full-fledged language, a body technique. Like a culture hero, he brings us a "greater understanding of what it means to be human" from the planet of Sign Language and Visual Culture traveling wirelessly through cultural space onto the screens in our very homes.[76] May we be ready to receive his gift and, in turn, give back.

Notes

1. Wladislav Zeitlin, "Der neue Fernseher nach meinem System" [The new television according to my system] (1924), in *Öffne deine Hand für die Stummen*, ed. Vera Bendt and Nicola Galliner (Berlin: Transit, 1993), 125.
2. Friedrich Reich, the principal of the Israelite Institution for Deaf-Mutes (ITA), to the president of the Kaiser-Wilhelm-Institute (the Royal Prussian Academy for Physics), December 30, 1924, quoted in Bendt and Galliner, *Öffne deine Hand für die Stummen,* 125.
3. *Verkannte Menschen,* directed by Alfred Kell (Berlin, Babelsberg: Universum-Film AG and Reichsverband der Gehörlosen, 1932), film.
4. One of these students, Friedrich Waldow, became the editor of the *Deutsche Gehörlosen Zeitung.* Another was Israel Savir. Savir met Zeitlin in the ITA and visited his laboratory there.
5. For example, in a letter, Dr. Gunther Marr, the chairman of the board of the School for Deaf-Mutes in Hamburg, and Mr. Wilhelm Behrens, the superintendent of the same school, requested Mrs. Becker, the president of the Commission for Apprenticeship Certification of the Professional Association of Tailors, to allow their Deaf students to pass their final exam in order to obtain their tailor's certificates. Marr and Behrens used Zeitlin's example as a deaf student who, after passing high school, was studying chemistry at university to convince Mrs. Becker. Facing the fact that it was possible for Zeitlin to overcome the obstacles posed by his deafness in order to study chemistry, Marr and Behrens argued, Mrs. Becker would have to admit that the same should be possible for those seeking to become tailors. Letter dated February 27, 1928, of Gunther Marr, on behalf of the board of the Taubstummenanstalt zu Hamburg (Institution for Deaf-Mutes, Hamburg), and Wilhelm Behrens, on behalf of the PTO of the Taubstummenschule zu Hamburg, Staatsarchiv Hamburg.
6. *Das Band*: *Zeitschrift der jüdischen Gehörlosen* 1 (1932): 4. This publication was edited by Verein zur Förderung der Interessen der israelitischen Taubstummen Deutschlands e.V. and Verein der ehemaligen Zöglinge der ITA, Israelitische Taubstummen-Anstalt zu Berlin-Weißensee, 1925–1936/7. All translations from German into English are my own.
7. I wish to thank Karen Taïeb at the Mémorial de la Shoah, who provided me with documents from the archive, and Serge Klarsfeld's *Hommage à trois scientifiques juifs déportés de France: Ayzyk Gorny, Vladislas Zeitline, Xenia Gourvitc* (Paris: Association Les fils et filles des déportés juifs de France, 1999). They helped to clarify the circumstances of Zeitlin's last days. Betty Müller-Latte, a former ITA teacher, wrote in her memoirs (1987–89) that Zeitlin died in Paris after arrest by the Gestapo. The same mistaken information is repeated in Bendt and Galliner, *Öffne deine Hand für die Stummen,* and Horst Biesold, *Klagende Hände* (Solms, Ger.: Jarick Oberbiel, 1988). The English version of Klarsfeld's *Memorial to the Jews Deported from France, 1942–1944* (New York: Beate Klarsfeld Foundation, 1983) omits the information of the French version. Biesold's English version, *Crying Hands: Eugenics and Deaf People in Nazi Germany* (Washington, D.C.: Gallaudet University Press, 1999), contains the same information as his 1988 German book.
8. Klarsfeld, *Hommage à trois scientifiques juifs déportés de France,* 48.
9. Karen Taïeb, e-mail message to the author, August 9, 2011.
10. On July 16–17, 1942, around thirteen thousand Jews were arrested with the help of more than forty-five hundred French policemen; from Klarsfeld, *Memorial to the Jews,* 60.
11. According to Klarsfeld, more than half of the men (504) were registered as prisoners, the remaining 375 (362 were over forty-five years old) being gassed upon arrival at the camp, with no further record of their deaths having been kept (ibid., 65).
12. Zeitlin, "Der neue Fernseher nach meinem System," 123.
13. Mary Bellis, "The Invention of Radio," "Inventors," About.com, accessed September 28, 2010, http://inventors.about.com/.
14. "Rundsehen analog zum Rundfunk"; "Der neue Fernseher nach meinem System," 124.

15. "Es ist mir gelungen, einen Apparat zu finden, durch welchen man auf einer Platte z.B. in Hannover sehen kann, wie wir hier in Berlin sitzen und uns bewegen"; ibid., 123.
16. Ibid.
17. Reich to president of the Kaiser-Wilhelm-Institute, December 30, 1924, mentioning Albert Einstein's compliment to Zeitlin's theoretical solution.
18. Zeitlin, "Der neue Fernseher nach meinem System," 125.
19. Ibid., 124.
20. Albert Abramson, *The History of Television, 1880 to 1941* (Jefferson, N.C.: McFarland, 1987), 220.
21. Klarsfeld, *Hommage à trois scientifiques juifs déportés de France,* 38–39.
22. Zeitlin donated 10 percent of the income from the patents to the ITA; *Das Band* 11 (1932): 91.
23. Klarsfeld, *Hommage à trois scientifiques juifs déportés de France,* 40–45.
24. Ibid., 37. See also George Shiers, *Early Television: A Bibliographic Guide to 1940* (New York: Garland, 1997), 395, 402, 404, 405, 409, 415, 416, 440, 455, 458, 469, 484; and Abramson, *The History of Television, 1880 to 1941,* 313–14. The coveted value of the patents before the invention of the 625-line television is illustrated by an injunction sought at the Superior Court of Brooklyn against Harriman International Corp., Television Corp. of America, Frank Alexander, and Henry Rosenthal in order to restrain them from using the Zeitlin patents (Shiers, *Early Television,* 310).
25. Wladislav Zeitlin, "Die Vor- und Nachteile der Gebärdensprache" [The advantages and disadvantages of sign language], in *Wladislaus Zeitlin, der taubstumme Student: Psychologische Einblicke*, ed. Felix Reich (Leipzig: Taubstummen-Verlag Hugo Dude, 1927), 50.
26. Harry G. Lang, *Silence of the Spheres: The Deaf Experience in the History of Science* (London: Greenwood, 1994), 114; Harry G. Lang and Bonnie Meath-Lang, *Deaf Persons in the Arts and Sciences: A Biographical Dictionary* (London: Greenwood, 1995), 361.
27. "Free Space" is the title of an 1883 publication of Zeitlin's, as quoted in Lang, *Silence of the Spheres,* 114.
28. Ibid.
29. Ibid., 63.
30. Ibid., 72.
31. Ibid., 114.
32. Wladislav Zeitlin, "Wie denke ich?" [How do I think?], in Reich, *Wladislaus Zeitlin, der taubstumme Student*, 31.
33. Frank Howe, cited in Lang, *Silence of the Spheres,* 63.
34. Lang, *Silence of the Spheres*, 73.
35. Lang and Meath-Lang, *Deaf Persons in the Arts and Sciences,* 111.
36. Lang, *Silence of the Spheres,* 99.
37. Ibid., 114.
38. Wladislav Zeitlin, "Wie empfinde ich meine Taubheit?" [How do I sense my deafness?], in Reich, *Wladislaus Zeitlin, der taubstumme Student,* 25.
39. Zeitlin, "Die Vor- und Nachteile der Gebärdensprache," 46. One should note here that Zeitlin was born with crippled feet and had to undergo a few major operations as a child (Wladislav Zeitlin, "Kennt ihr meine Mutter?" [Do you know my mother?], in Reich, *Wladislaus Zeitlin, der taubstumme Student,* 53n).
40. Zeitlin, "Kennt ihr meine Mutter?," 54.
41. "Dies mag illustrieren, wie ich die Taubheit nicht als einen Mangel fühle"; "Wie empfinde ich meine Taubheit?," 23.
42. Ibid., 25.
43. Wladislav Zeitlin, "Was gibt mir als Taubstummen das Theater?" [How do I benefit from theater?], in Reich, *Wladislaus Zeitlin, der taubstumme Student,* 29.
44. Ibid., 30.

45. Zeitlin, "Der neue Fernseher nach meinem System," 124.
46. Bernard D. Geoghegan, "An Introduction to Kulturtechnik: American Liberalism as a Cultural Technology," Geoghegan's Web site, accessed February 18, 2013, http://bernardg.com/.
47. "The symbolizing language of the eyes is that every object seen is simultaneously attributed with a special movement of the hand or sign, and later cognition learns to always connect this parallel action with the object. . . . (One may compare it with algebra in which letters of the alphabet can be assigned completely arbitrarily.)"; Zeitlin, "Die Vor- und Nachteile der Gebärdensprache," 46–47; also see 48 and "Sprache der Augen," 46.
48. Israel Savir, conversation with the author at the Sixth Deaf History International Conference, Berlin, July 31–August 4, 2006.
49. Zeitlin, "Die Vor- und Nachteile der Gebärdensprache," 49.
50. "For the deaf person a conflict arises because he firstly does not know what these terms apply to and secondly, they seem to symbolize to him the hearing way of thinking"; ibid., 50. See also Zeitlin, "Wie denke ich?," 31.
51. Zeitlin, "Die Vor- und Nachteile der Gebärdensprache," 52.
52. Reich, *Wladislaus Zeitlin, der taubstumme Student,* 22.
53. Zeitlin, "Die Vor- und Nachteile der Gebärdensprache," 51n.
54. Reich, appendix to *Wladislaus Zeitlin, der taubstumme Student,* 56.
55. The *Schweizerische Taubstummen-Zeitung* is quoted in an advertisement for Zeitlin's book of essays, admonishing all educators "with a pointing finger" to follow the method Zeitlin suggested ("Wladislaus Zeitlin: Der taubstumme Student," advertisement, *Die Stimme* 12 [1927]).
56. Zeitlin, "Die Vor- und Nachteile der Gebärdensprache," 51.
57. The German word *Gesicht* does not find its full equivalent in the English "face," although this is its most common translation. It comes closer to being a verb covering a semiotic field associated with personhood, vision, sense of sight, and a way of regarding something or someone. See Erhard Schüttpelz, "Körpertechniken," in *Kulturtechnik: Zeitschrift für Medien- und Kulturforschung,* ed. Lorenz Engell and Bernhard Siegert (Weimar: ZMK Internationales Kolleg für Kulturtechnikforschung und Medienphilosophie, 2010), 1:101–20.
58. Zeitlin, "Wie denke ich?," 31.
59. Ibid., 32.
60. Ibid., 36–37.
61. Immanuel Kant, *Critique of Pure Reason,* trans. Norman Kemp Smith (New York: St. Martin's, 1929), A256/B312, 272–73.
62. "The hearing person who often imagines the deaf-mute as a creature waving about his hands in the air and uttering inarticulate sounds, as a creature isolated from our human society, shall realize from this book that the deaf-mute who dis-mutes by receiving education and becomes merely deaf, can perform the same tasks as a hearing person if only the means and the opportunity to do so are granted to him in order to develop his abilities accordingly"; Reich, foreword to *Wladislaus Zeitlin, der taubstumme Student,* 5. This passage is quoted in the book advertisement cited in n. 55.
63. Zeitlin, "Die Vor- und Nachteile der Gebärdensprache," 52.
64. Zeitlin, "Wie empfinde ich meine Taubheit?," 27.
65. Ibid., 23–28.
66. Zeitlin writes "visuell veranlagt"; "veranlagt" would translate as "inclined, disposed, or tending toward something" (ibid., 25). I chose to translate it as "wired" because it refers to cognitive-neurological matters, pertaining to genetics as well as the realm of electricity, which will be of importance later in the text.
67. Ibid., 25.
68. Ibid., 26.
69. Ibid., 27.

70. Wladislav Zeitlin, "Wie empfinde ich mein Sprechen?" [How do I sense my speaking?], in Reich, *Wladislaus Zeitlin, der taubstumme Student,* 42–43.
71. Ibid., 45.
72. Zeitlin, "Wie empfinde ich meine Taubheit?," 27.
73. Rudolf Eiseler, "Innerer Sinn," *Kant-Lexikon* (1930), at Textlog.de: Historische Texte und Wörterbücher, ed. Peter Kietzmann, accessed February 18, 2013, http://www.textlog.de/32622.html.
74. Zeitlin, "Wie empfinde ich meine Taubheit?," 28.
75. Zeitlin, postcard, July 14, 1942, quoted in Klarsfeld, *Hommage à trois scientifiques juifs déportés de France,* 50. Translation courtesy of Aneta Chavizon.
76. H-Dirksen L. Bauman and Joseph M. Murray, "Reframing: From Hearing Loss to DeafGain," trans. Fallon Briyendine and Emily Schenker, *Deaf Studies Digital Journal* 1 (2009): 5, http://dsdj.gallaudet.edu/assets/section/section2/entry19/DSDJ_entry19.pdf.

16

THE HIDDEN GAIN

A New Lens of Research with d/Deaf Children and Adults

HILARY SUTHERLAND AND KATHERINE D. ROGERS

This chapter explores how elements of research, including research questions, study design, data collection and data analysis, could be carried out with the aim of increasing understanding of Deaf Gain. The development of "visually reliant tools" will be used as an example of eliciting responses from Deaf children and adults. The authors, Hilary Sutherland and Katherine Rogers, have been Deaf since birth and are experienced researchers. Much of their work involves the perspectives of the Deaf community and d/Deaf children and their families, which may include identifying some elements of their developing positive outlooks on their lives. Too often, d/Deaf people are investigated in terms of what they "lack" and of their "inabilities."[1]

H-Dirksen Bauman and Joseph Murray discuss how people tend to think of a cup without water in it as being empty, without giving much thought to its being full of oxygen.[2] They point out that this phenomenon is similar to the way society often considers d/Deaf people as lacking something, namely, the ability to hear and produce spoken language. However, when a different lens is used, a different sense of fullness can be detected. Bauman and Murray also report that the intrinsic values of, for example, Deaf culture and sign languages for Deaf people have been explored, whereas they acknowledge that the extrinsic value of Deaf people's contributions to human diversity have been little explored.[3] Past research on topics that have usually been considered important to researchers—for example, Deaf people's lack of spoken language and the ability to participate in hearing society—may not always have reflected Deaf people's views on what is important.

Past studies involving d/Deaf people have often compared them with their hearing peers in areas like academic achievement,[4] social-emotional well-being,[5] and social cognition.[6] However, findings arising from such comparisons could be unreliable because of the methods of data collection used and because the researchers' interpretations of their analysis may not capture evidence of Deaf Gain. They might not have considered that hearing people may *lack* something that Deaf people may have gained. Another way of looking at this is to note that a

researcher would not dream of testing hearing people who cannot sign in order to establish their receptive and productive signing skills. If such a study were indeed conducted, the results would show that these hearing people *lacked* the ability to use sign language.

Hardly any studies have been carried out with hearing people in which the research paradigm is Deaf-focused. By contrast, research designs that have been used on hearing people are often adapted to be used with Deaf people. Very little thought has been given to considering that most Deaf people who were born Deaf may experience things differently from hearing people. It would seem logical that in carrying out successful research with Deaf people, attention should be given to ensuring not only that the research design is as Deaf-centered as possible but also that it is carried out by experienced Deaf researchers.

The experiences we have when growing up are likely to affect the way we each decide what constitutes a good quality of life. Hearing researchers may have very little understanding of what "good quality of life" means to a Deaf person, unless they happen to have had contact with Deaf people and a Deaf cultural understanding via their families. Therefore, it is unlikely that hearing researchers would be able to achieve the kind of outlook that Deaf researchers have when analyzing data collection that is based on cultural perspectives.[7] What could be assumed to be missing from Deaf people's lives and having a detrimental effect on their quality of life, namely, not being able to access some everyday sound-based information, would be seen as an important part of the research study. A research study that looked at the experiences of d/Deaf people would likely pay less attention to sound-based information.

Many people take the view that being Deaf, as a researcher, would be an advantageous quality to have when working with Deaf children and adults. One advantage is that a Deaf researcher would be able to share the subjects' Deaf-centered life experiences; without this common base, researchers would not have the fullest understanding of Deaf perspectives. Gordon Forbes suggests that researchers who do not share the same language and culture as their participants should consider working with a coinvestigator who is native to that particular culture.[8] Gisela Agyeman points out that "[a]ccessing the Life Worlds of under-represented and marginalised groups presents a significant challenge for researchers who are not part of these life worlds and who want to be credible in their representation of the Other."[9]

It is not enough simply to suggest that only Deaf researchers be used when carrying out research with Deaf people. There are other things to consider, for example, the aim of the research, the way data is collected, and the interpretation of the findings. Moreover, attention should be paid to the whole research design, and researchers should be very clear about the purpose of asking particular research questions, in order to enable Deaf people to expand on their understanding

of Deaf Gain. To do this well would also require considering the most appropriate tools to use in order to elicit the maximum contribution from Deaf people, including deciding on how to analyze the data collected from a positive stance.

Many would argue that one of the most necessary skills of a good researcher is to have an "open and enquiring mind."[10] This may be true, but it is also worth remembering that we each bring our own expectations and values and personal influences and biases to our definition of a good quality of life. In doing research with d/Deaf adults and children, it is equally important to acknowledge that the participants will have their own expectations and values, too. Therefore, it is necessary to consider matching researchers' and participants' linguistic and cultural needs as much as possible, in order to find out as much about participants' definitions as is possible. This kind of insight would offer additional cues about their expectations and values that might not be the same for hearing people.

Let us consider designing suitable tools that would elicit and maximize participants' contributions. Eliciting tools can be used in many ways; here, we focus on their visual qualities, so we will call them visually reliant tools. In the course of the discussion, we will emphasize how being Deaf and having been Deaf children have helped the authors to devise their research processes, including the use of visually reliant tools. We also believe in the importance of involving d/Deaf participants as equals in order to learn from them the appropriateness of using such methods. In other words, we actively encourage Deaf participants to notice what is happening to them throughout the research process, by way of an empowerment through which they are able to notice the differences about themselves when compared to people of different communities, and through which they learn it is okay to be different. This kind of insight can help them to feel more positive about themselves and to raise awareness about human diversity across the population.

Visually Reliant Tools Used in Research

Visually reliant tools to be used for eliciting purposes could serve as an alternative way for participants to express their thoughts and feelings other than in written or spoken English. This alternative approach may suit certain people, such as those whose first language is not English, as explained by Marc Marschark in his article "Intellectual Functioning of Deaf Adults and Children":

> Intelligence has long been seen as linked to the spoken and written word. Because most deaf people have poor spoken language skills and find reading a significant challenge, there is a history in both psychology and education of considering deaf individuals to be less intelligent or less cognitively flexible than hearing individuals. With progress in understanding natural signed languages and cognitive abilities of individuals who lack spoken

> language, this perspective has changed. We now recognise, for example, that deaf people have some advantages in visuospatial ability to hearing people, and there is a link between the use of natural signed language and enhanced visuospatial abilities in several domains.[11]

To stress Marschark's point, Howard Gardner explains that we need to take into consideration the needs of those with different intellectual abilities. This means meeting the needs of different learning styles.[12] In order to take advantage of Deaf people's visuospatial abilities, it is important to collect data from Deaf people that are visually, linguistically, and culturally appropriate.

Deaf children and adults, particularly if they are sign-language users, may find using visually reliant tools less restrictive than operating in their second language, English. A group of signers may prefer to sign among themselves than to communicate with nonsigners. The same could be said of those who prefer to use visually reliant tools rather than English-based materials, which they may find more restrictive, for example, for expressing their innermost thoughts. Using visually reliant tools as the main means of eliciting responses could be a way forward in getting Deaf native signers to express themselves more fully. As Marschark suggests, relying on visually reliant materials does not mean that this particular group of people is at a disadvantage. Some people may have different ideas about what visually reliant tools are: they may include the use of drawing, taking photographs, making video diaries, and/or holding discussions in sign language.

These ideas are not new and have been part of research methods previously. However, what is important in this instance is the fact that visually reliant tools give Deaf participants the opportunity to express themselves in ways that they can identify with and be comfortable with. This may include, for example, using British Sign Language as part of Deaf culture. Studies tend to focus on d/Deaf people's lack of abilities, such as their competency in English; as is commonly quoted in many studies, many d/Deaf children leave school not being able to achieve competency in English equal to their hearing counterparts.[13] Therefore, it is necessary to allow them opportunities to comment on their experiences when doing research with them, so that we, as researchers, can learn from their perspectives. By not taking into consideration the linguistic and cultural perspectives of Deaf people, thus gaining data only from those who are skilled users of English, we limit what we can learn.

As we have said, the idea of using creative tools is not new. Many child- or person-centered studies have incorporated the use of creative tools; it is the terminology that has only quite recently been acknowledged. That is to say, using the phrase "visually reliant tools" could be invaluable. Hilary Sutherland mentions in her doctoral thesis, "Sign Bilingualism through the Eyes of a Child," that visually reliant tools were used as one of the main means of collecting data in her study in order to develop the concept of Deaf Gain.[14]

An Example of Using Visually Reliant Tools in a Deaf-Led Study: Sign Bilingualism through the Eyes of a Child

To explain Sutherland's study briefly, eight profoundly Deaf children who used British Sign Language as their preferred language participated in the research at three points: when they were 9–10 years old, 11–12 years old, and 15–16 years old. The children all attended the same sign-bilingual education program in the United Kingdom, progressing to secondary education in the course of the research.

The research consisted of three studies. The first study involved a series of six group workshops with multiple activities designed to explore children's experiences of sign-bilingual education, their perceptions of British Sign Language and English, and the relationship between the Deaf and hearing worlds. Individual interviews were carried out with the children in the second study, to elaborate on data produced in the workshops. Finally, a third study was undertaken using a computer-assisted feedback program with the children, to enable them to comment on the analysis of studies 1 and 2 and to add or change their views from their more mature perspective, supplemented by individual follow-up interviews.

A copy of the visual information sheet shown in Figure 16.1 was given to the children in the first study to keep them informed of the different themes explored and the different eliciting tools used during their workshop sessions.

Starting with the series of six workshops, it was important to keep the children engaged throughout the duration of the six-year study, especially given that they were young. Steps were taken to ensure that activities were fun, the children were properly prepared to work through increasingly complex ideas, and their language preferences were met. A developing sense of shared ownership of the project was also a goal. The visually reliant tools in the workshop sessions included personal video diaries, drawings, an outside presenter as a trigger for peer interviews, group discussions carried out in British Sign Language, photography, and posters.

Children's work at the workshop sessions served as prompting tools to encourage the children to expand their answers in their individual interviews. In order to get the children to open up and talk about their sign-bilingual experiences, Sutherland made sure that her data-collection methods were Deaf-child-centered, thus enabling the children to express their thoughts and feelings freely, with minimal influence from her. In capturing their "voices" (their signed contributions, including the manner in which their views were expressed) on videotape, she was careful that their views were not misinterpreted.

Other Possible Contributions for Consideration

As well as using visually reliant tools to prompt children and adults, it has been useful to gauge participants' views as to how these tools could be further developed, discussing, for example, the role of the Deaf researcher, the adaptation of instruments, and the use of information technology.

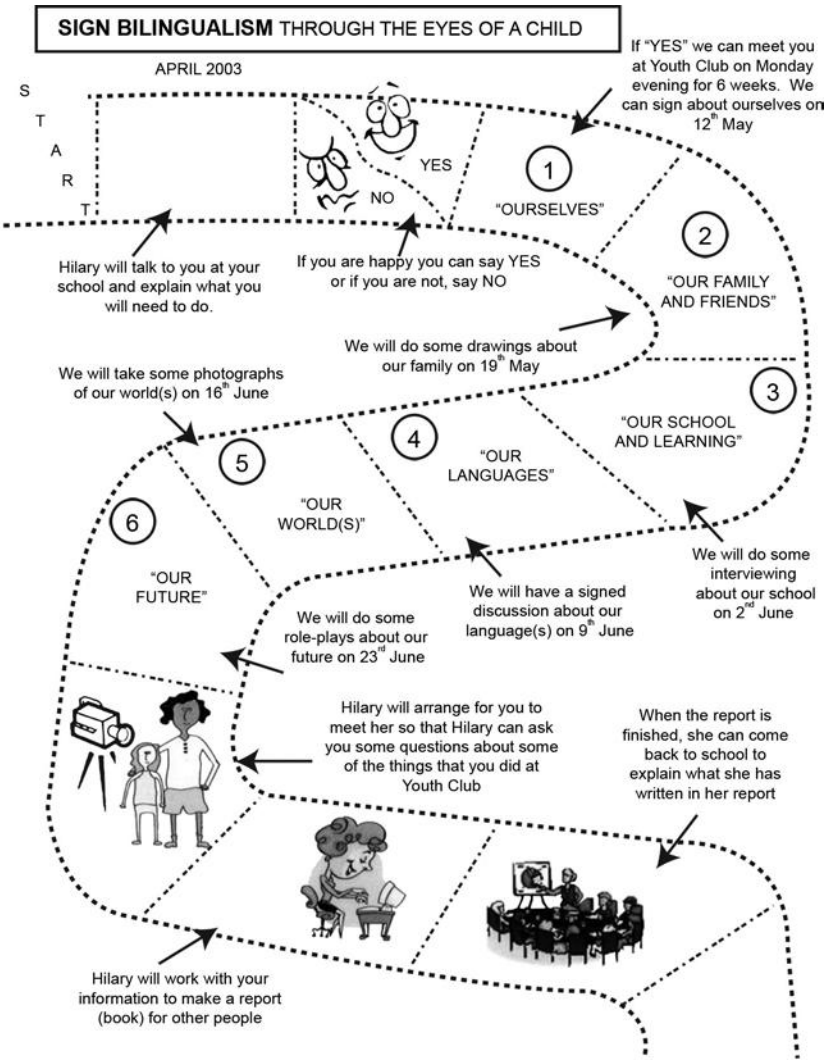


Figure 16.1. The children's information sheet. Created by Hilary Sutherland.

The Development of Eliciting Tools

In the sign-bilingual study by Sutherland, using children's drawings or taking photographs to contribute to the research were not new methods, but they were very useful in getting the children to talk about what was happening in their lives. Getting the children to make their own video-diary collections brought out hidden benefits in that the children were able to record their own comments on different themes, and they had the freedom to say whatever they wanted to in their first language.

The Purposes of the Video Diaries

The video diaries were something that the children could "own" and produce in their preferred language, with hardly any intervention from adults. This exercise also allowed the children to rationalize their reasons for making the comments they made; this encouraged them to use their reflective skills. This marks an important step forward in research with d/Deaf participants. In some research, Deaf children have not been given opportunities to express their views, as it was thought that this was not possible. Wendy Lynas, for example, stated that d/Deaf children "are not in a position to choose for themselves" regarding how they wish to communicate.[15] This implies that d/Deaf children lack the ability to produce their own thoughts and reasoning.

We often do not know what Deaf children's experiences are like for them, having to wait until they become adults before they tell us. Some of their perspectives will have been colored by then; thus, grasping an opportunity to collect data when they are children is rare. Pia Christensen and Allison James have explained that in traditional research studies, questions asked about children's lives are usually answered by their caretakers, through personal observation, and the answers are quite likely to be colored by the caretakers' own growing-up experiences.[16]

The Aims of Peer Interviews

In the children's peer interviews with each other, they asked questions about two languages, British Sign Language and English, and their answers provided some useful insights into their perspectives. The richness of the data captured, including the use of body language and facial expressions, also led the children to notice their behavior on tape, thus providing some extra insights. Deaf children very rarely get to see their own contributions, and this experience raised their self-awareness and enabled them to notice what was happening. In a sense, it gave the children scope to think more profoundly about things that are not always so obvious, such as noticing the attitudes of certain people and developing interpretations of what they could see around them. Making video diaries could be seen as a form of empowerment, because the children were taking responsibility for their own statements. This helped them to draw their own conclusions and articulate their views on tape. Finally, by acknowledging what they had to say about their experiences, we, as researchers, were seeing and valuing what they had to say for themselves through the use of appropriate eliciting tools.

The Role of the Deaf Researcher

Although the idea of pairing Deaf researchers with d/Deaf participants is not new, involving d/Deaf participants in a research team brings about the idea of "research *with* deaf people rather than *on* deaf people."[17] However, it is still important that Deaf researchers are actively involved during the analyzing stage, in order

to convey Deaf perspectives that may differ from other perspectives through the common shared experiences of the researchers and participants.[18] Deaf researchers can occupy an advantageous position, because they were Deaf children at one time; this may help participants to open up more (although it could be argued that it may have the opposite effect, if awareness of this common ground leads participants to make the assumption that they do not need to expand on their responses). One example of Deaf Gain in this regard is that Deaf researchers are more likely to pick up on and act upon the subtlety of body language that may provide additional cues to participants' emotive responses (Deaf signers tend to pick up on body language more quickly than hearing signers).[19] Often, researchers' comments have enabled Deaf participants to further expand on their explanations, thus providing useful insights. Katherine Rogers and Alys Young's evaluation of a Deaf role-models project in England involved collecting data from d/Deaf people who carried out the role of a Deaf role model (DRM) to d/Deaf children, their families, and professionals.[20] The data were collected via group discussions and analyzed by a Deaf researcher (Rogers). One of the findings on the experience of being a DRM, on a personal level, was pride in being Deaf. This might not be surprising to those who are culturally Deaf, but for deaf people, being a DRM enabled them to explore their identities; as one said, "[I]t's been a little journey and hopefully it will continue."[21] A researcher from a different cultural and linguistic background might have believed this attitude would be the norm for a d/Deaf person, but in this instance it was important to check with the DRM as to whether that person would define being d/Deaf as a positive or negative aspect. Such an interpretation would depend very much on whose lens we are looking through.

Sometimes Deaf people's contributions can be subtle and part of Deaf collective understanding, so that they do not need to be expressed explicitly. Deaf ways of thinking can be very different from the way hearing people think; as Peter Hauser and his colleagues have stated, "[V]isually oriented beings think and view the world differently from the majority."[22] They describe Deaf people as visually oriented beings, as they do not rely on audio. However, sometimes these differences may be misinterpreted by hearing people as a "problem." Tom McIntyre studied how cognitive styles vary across groups of people, pointing out that they could be misinterpreted as difficulties, such as a learning disability, which in turn could create an emotional and/or behavioral problem for an individual.[23]

The question to be asked here is, are we, as Deaf researchers, a form of visually reliant tool? Some hearing researchers may be fluent signers, but is good research about more than being able to sign well? Deaf researchers are also able to adjust appropriately to match each communication need, and to consider what might or might not work with participants. We believe that this ability can come only from those who have had a lifetime of knowing what it is like to be misunderstood; issues of trust and common cultural values are very important here. A similar effect could be found when considering the ethnic or gender background of the

interviewer and the language used to communicate with the interviewee. The representation of a researcher who is outside the participants' cultural group could derive from historical processes through which Deaf people have been excluded and misrepresented. Similarly, ethnic groups or minorities are often misrepresented, thus making them suspicious when research is undertaken, especially by those who originate from outside their community.

The Adaptation of Instruments

The appreciation of sign languages as visual languages is sometimes not taken into account when collecting data from Deaf participants, which could result in data that is not reliable and valid. Previous studies have used instruments that have been standardized in hearing populations. These may be unmodified[24] or modified into plain English,[25] and/or an instructor has been used to explain what questions mean to d/Deaf participants.[26] Some researchers might think it is appropriate to use instruments that have been standardized in one population (such as a hearing population) with another population (such as a Deaf population), as they may think that the standardized assessment will not be culturally biased; this is known as an etic approach.[27] Deaf populations have different languages and cultural values from hearing populations, though, so when using an instrument with a Deaf population that has been the norm in a hearing population, data from Deaf people might come up as outliers from the norm. This result might be interpreted as follows: Deaf people are lacking in ability or performance or competence or mental stability. This, as Bauman and Murray have pointed out, is how "the concept of disability emerged."[28] By contrast, a few instruments have measured Deaf people's strengths, such as sign-language skills[29] and visual attention,[30] but it is not known whether there are any other standardized instruments that aim to seek data on Deaf Gain.

The adaptation of standardized instruments to collect data is not straightforward. Considering aspects such as methods of translating from one language to another, if a signed version is not checked against a written version, the actual measurement for one version could be different from that of another. One method of translation involves using a back-translation procedure: the standardized written instrument is translated into sign language and then back-translated into the original written language by someone who has not seen the original version. This ensures that the written and signed versions of the assessment are equivalent in content. To capture the concepts behind assessment items in a way that is culturally appropriate for d/Deaf populations, translators need to be bilingual and bicultural. When making an instrument more visually reliant, one needs to consider the cultural and linguistic values of Deaf people in order to capture a truer result that can contribute to Deaf Gain; for example, finding out participants' definitions of their well-being from a positive stance. However, if we fix on the idea of making sure the standardized assessments are developed only with the hearing population

in mind, making sure they are linguistically and culturally appropriate, it is likely that we will never fully appreciate the abilities of Deaf people. Only by making assessments more Deaf-centered can we learn more about Deaf Gain.

The Use of Information Technology

With sign languages being visual languages, it has been necessary to develop IT resources to collect data in a visual format. This has been done by making visual materials available on CDs, DVDs, iPads, and other mobile devices, and Web sites, as well as in software specifically developed for a particular project. In Sutherland's study discussed earlier, questions were asked in British Sign Language, and it was also was possible to record the data visually. Again, this idea is not new. However, the nature of videotaping interviews with Deaf children and/or adults in their language raises a serious ethical issue. Unlike audiotaping hearing participants' responses, where they can remain anonymous, it is not possible to anonymize video data. To maintain its security and confidentiality, the video data need to meet the regulations for good practice in research and to have been reviewed by the research-ethics committee. Therefore, it is often necessary to do much work beforehand to build up the trust necessary for participants to feel comfortable understanding that their contributions will be seen only by the researchers and, once written up, will be erased after the project has ended. Face-to-face explanations of this process are often called for before interviews take place. Alternatively, it would be possible to use a signing model (or actor) to protect the true identity of the contributor, unless the participants were willing to forgo their anonymity.

In the final stage of her sign-bilingualism study, Sutherland custom-designed software that would enable the children in her study to view English text and observe signed clips. This meant the children could decide which mode to view the information from their two earlier studies. By designing software that would allow the reporting back of earlier findings to the children, Sutherland wanted to use the opportunity to seek clarification and confirmation, as well as to allow the children to refute any findings where necessary. Now that the children were older (15–16 years), the researcher wanted them to look back critically at their younger selves and to explore their present views and feelings to see whether any of their views had changed over time.

Data collection for this study was carried out in two parts, via a DVD and interviews. The DVD was prepared with information presented in both signed and written formats, along with an interactive questionnaire specifically created to enable the children to add their comments, either by typing or signing their answers (see Figure 16.2 for an example of an interactive questionnaire). Follow-up semi-structured interviews were conducted with each child, based on his or her answers from the interactive program, to give the child the opportunity to expand.

Figure 16.2 shows what the children would see on their computer screens when they accessed the custom-designed software, which combined the input of

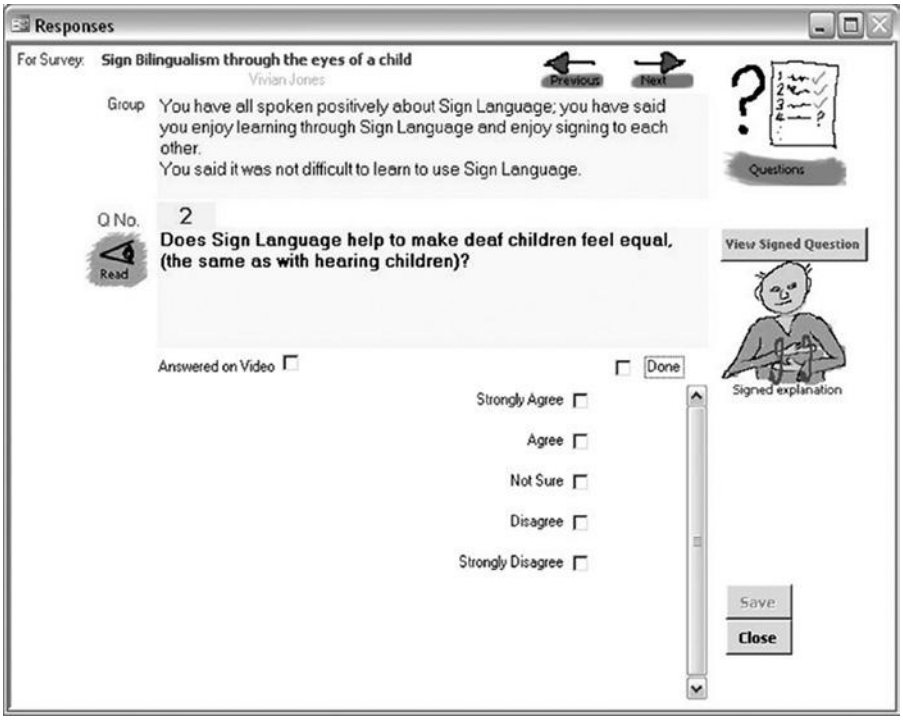


Figure 16.2. The children's questionnaire. Screen capture developed by Colin Jones.

surveys, questions, a subject's response, and videos. Information was shown in written text, but the children had the option to view the same information in British Sign Language by clicking on an icon.

The advantages of this approach were that the children were still free from adult intervention, and the software could easily accommodate both British Sign Language and English, thus providing children with a choice regarding how they wanted to view and respond to the information. The researcher benefited by observing closely how the children chose to respond; she was thus provided with extra information to gauge the possible usefulness of implementing suitably adapted software in future Deaf education.

Sutherland found that getting children to confirm different findings throughout the study, using visually reliant tools, meant that the researchers gained a much better idea of what was important in their lives. We could see things through their eyes, such as recognizing that

- British Sign Language has a significant role in their lives;
- having Deaf friends means they have friends for life;
- sign bilingualism has enabled them to become more sophisticated with their communication.

This list suggests that what the Deaf children in Sutherland's study valued could be seen as intrinsic Deaf Gain. The extrinsic gain, here, is that the findings could apply to all of those in minority communities where their language differs from the majority language. Hearing people might not see these findings as valuable, thinking it is healthier to have different friends throughout one's life and that English is a valued language. Sutherland's findings would not necessarily be seen and valued as part of hearing culture. Hauser and others have pointed out "[h]ow deaf people view themselves differently from how hearing perceive them."[31] This kind of insight can help us to understand more about the diversity of children and adults across the population, which broadens our understanding of human nature.

Conclusion

What has been exciting in pursuing more Deaf Gain–based research is that we now know it is possible to collect Deaf people's responses, thus providing readers with greater insights. In doing so, not only do we have a better understanding of Deaf people's experiences, but also this research can allow them to have a much greater say in, for example, how they wish to be educated or how they describe what "well-being" means to them. Involving d/Deaf people in this process can also increase the reliability of the data that are collected from them. When we are able to place ourselves in Deaf participants' epistemological positions, we can start to understand where they are coming from, that is, by allowing the d/Deaf participants to express their thoughts and concerns in the language that they feel most comfortable in and working with them from their "deaf framework."[32]

The message that the authors wish to enforce is the importance of the whole research. Being restricted to hearing research paradigms could run the risk of emphasizing abilities that Deaf people lack and does not provide us with the true picture. Research paradigms need to be Deaf-centered and visually oriented, to gain a greater understanding of Deaf Gain. We need to come up with more Deaf-centered research that is appropriately designed, in order to capture Deaf people's perspectives and linguistic and cultural characteristics in a positive way. In turn, this could contribute to our understanding of the possibly intrinsic nature of Deaf Gain. Such research would enable readers to understand more about Deaf ways of being that can enrich their understanding, and about the wider acceptance of the cultural diversity of human experiences.

Notes

1. Paddy Ladd, *Understanding Deaf Culture: In Search of Deafhood* (Clevedon, UK: Multilingual Matters, 2003).
2. H-Dirksen L. Bauman and Joseph J. Murray, "Reframing: From Hearing Loss to Deaf Gain," *Deaf Studies Digital Journal* 1 (2009): 1–10, http://dsdj.gallaudet.edu/.
3. H-Dirksen L. Bauman and Joseph J. Murray, "Deaf Studies in the Twenty-First Century:

'Deaf-Gain' and the Future of Human Diversity," in *Oxford Handbook on Deaf Studies and Deaf Education*, ed. Marc Marschark and Patricia E. Spencer (Oxford: Oxford University Press, 2010), 2:210–25.

4. Carol B. Traxler, "The Stanford Achievement Test, Ninth Edition: National Norming and Performance Standards for Deaf and Hard-of-Hearing Students," *Journal of Deaf Studies and Deaf Education* 5, no. 4 (2000): 337–48.
5. Fred H. Bess, Jeanne Dodd-Murphy, and Robert A. Parker, "Children with Minimal Sensorineural Hearing Loss: Prevalence, Educational Performance, and Functional Status," *Ear and Hearing* 19, no. 5 (1998): 339–54.
6. Mary Howley and Christine Howe, "Social Interaction and Cognitive Growth: An Examination through the Role-Taking Skills of Deaf and Hearing Children," *British Journal of Developmental Psychology* 22, no. 2 (2004): 219–43.
7. Alys M. Young and Jennifer Ackerman, "Reflections on Validity and Epistemology in a Study of Working Relations between Deaf and Hearing Professionals," *Qualitative Health Research* 11, no. 2 (2001): 179–89.
8. Gordon B. Forbes, "Cross-Cultural Research Methods and the Study of Gender," in *Handbook of Gender Research in Psychology,* ed. Joan C. Chrisler and Donald R. McCreary (New York: Springer, 2010), 159–77.
9. Gisela S. Agyeman, "White Researcher–Black Subjects: Exploring the Challenges of Researching the Marginalised and 'Invisible,'" *Electronic Journal of Business Research Methods* 6, no. 1 (2008): 78.
10. Colin Robson, *Real World Research,* 2nd ed. (Oxford: Blackwell, 2002), 167.
11. Marc Marschark, "Intellectual Functioning of Deaf Adults and Children: Answers and Questions," *European Journal of Cognitive Psychology* 18, no. 1 (2006): 70.
12. Howard Gardner, *Frames of Mind: The Theory of Multiple Intelligences* (New York: Basic Books, 1983).
13. Richard Conrad, *The Deaf Schoolchild: Language and Cognitive Function* (London: Harper & Row, 1979); Stephen Powers, Susan Gregory, and Ernst D. Thoutenhoofd, "The Educational Achievements of Deaf Children: A Literature Review—Executive Summary," *Deafness and Education International* 1, no. 1 (1999): 1–9.
14. Hilary Sutherland, "Sign Bilingualism through the Eyes of a Child" (doctoral diss., University of Manchester, 2008).
15. Wendy Lynas, *Communication Options in the Education of Deaf Children* (London: Whurr, 1994), viii.
16. Pia Christensen and Allison James, eds., *Research with Children: Perspectives and Practices* (London: Routleigh Falmer, 2000).
17. Charlotte Baker-Shenk and Jim G. Kyle, "Research with Deaf People: Issues and Conflicts," *Disability, Handicap, and Society* 5, no. 1 (1990): 65–75.
18. Young and Ackerman, "Reflections on Validity and Epistemology in a Study of Working Relations between Deaf and Hearing Professionals."
19. David P. Corina and Michael Grosvald, "Exploring Perceptual Processing of ASL and Human Actions: Effect of Inversion and Repetition Priming," *Cognition* 122, no. 3 (2011): 330–45.
20. Katherine Rogers and Alys Young, "Being a Deaf Role Model: Deaf People's Experiences of Working with Families and Deaf Young People," *Deafness and Education International* 13, no. 1 (2011): 2–16.
21. Ibid., 13.
22. Peter C. Hauser, Amanda O'Hearn, et al., "Deaf Epistemology: Deafhood and Deafness," *American Annals of the Deaf* 154, no. 5 (2010): 486.
23. Tom McIntyre, "Does the Way We Teach Create Behaviour Disorders in Culturally Different Students?," *Education and Treatment of Children* 19, no. 3 (1996): 354–70.
24. Manfred Hintermair, "Self-Esteem and Satisfaction with Life of Deaf and Hard-of-Hearing

People: A Resource-Oriented Approach to Identity Work," *Journal of Deaf Studies and Deaf Education* 13, no. 2 (2008): 278–300.

25. Claire M. Connolly, "Deafness and Mental Health, Vol. 1" (doctoral diss., University of Birmingham, 2004).
26. Jamie A. Wilson and Marion G. Wells, "Telehealth and the Deaf: A Comparison Study," *Journal of Deaf Studies and Deaf Education* 14, no. 3 (2009): 386–402.
27. Margarita Alegria et al., "Cultural Relevance and Equivalence in the NLAAS Instrument: Integrating Etic and Emic in the Development of Cross-Cultural Measures for a Psychiatric Epidemiology and Services Study of Latinos," *International Journal of Methods in Psychiatric Research* 13, no. 4 (2004): 270–88.
28. Bauman and Murray, "Reframing," 1.
29. Peter C. Hauser, Raylene Paludneviciene, et al., "American Sign Language–Sentence Reproduction Test: Development and Implications," in *Sign Language: Spinning and Unravelling the Past, Present, and Future,* ed. Ronice M. de Quadros (Petropolis, Brazil: Editora Arara Azul, 2008), 160–72; Ros Herman et al., *Assessing BSL Development: Production Test (Narrative Skills)* (London: City University Publication, 2004).
30. Matt W. G. Dye, Peter C. Hauser, and Daphne Bavelier, "Is Visual Selective Attention in Deaf Individuals Enhanced or Deficient? The Case of the Useful Field of View," *PLoS One* 4, no. 5 (2009): e5640.
31. Hauser, O'Hearn, et al., "Deaf Epistemology," 486.
32. Maria Gascon-Ramos, "Well-Being in Deaf Children: A Framework of Understanding" (doctoral diss., University of Bristol, 2005).

V

SOCIAL **GAINS**

17

DEAF GAIN AND SHARED SIGNING COMMUNITIES

ANNELIES KUSTERS

In their introduction to the Deaf Gain concept, H-Dirksen Bauman and Joseph Murray describe Deaf Gain as the opposite of hearing loss, "reframing deafness, not as a lack, but as a form of human diversity capable of making vital contributions to the greater good of society."[1] They refer to Teresa Blankmeyer Burke, who has distinguished the two notions implicit in this statement (diversity and contributions) as intrinsic and extrinsic values of deaf people, their communities, and their languages.[2] The term *Deaf Gain* was coined to highlight these very values. Whether these notions are represented in commonsensical discourses in wider society is dependent on the sociocultural and historical contexts in which deaf people are situated. On the one hand, historically there was an "oversight of sign languages and Deaf communities as having intrinsic and extrinsic value to human diversity," Bauman and Murray argue.[3] On the other hand, there are contexts where deaf people thrive and sign languages emerge. In this respect, "shared signing communities" are particularly interesting places to consider. Shared signing communities are villages, towns, or groups where, because of the historical presence of a hereditary form of deafness that is circulated in the communities through endogamous marriages, a relatively high number of deaf people have lived together with hearing people for decades or even centuries.[4] Examples include the Al-Sayyid bedouin in Israel, Ban Khor in Thailand, Bengkala (also known as Desa Kolok) in Bali, and Adamorobe in Ghana.[5] Over the years, the need to communicate with one another in the dense sociocultural networks of these communities has led to the emergence of local sign languages used by both deaf and hearing people, called "shared sign languages" by Victoria Nyst.[6] In these communities, signing does not single out deaf people: "signing is not what deaf people 'do,' but rather a medium for deaf and hearing people to communicate."[7] As a result, I will discuss these communities in the light of their contribution to human diversity and diversity between human communities—and thus to Deaf Gain.

Probably the most well-known shared signing community was located on Martha's Vineyard, an island off Cape Cod in Massachusetts, renowned as a place where "everyone spoke sign language" for several hundred years. Because of a

"recessive pattern" of genetic deafness, circulated through endogamous marriage practices, the rate of deafness on this island averaged 1:155 and peaked at 1:4 in a neighborhood in the town of Chilmark. The community featured a dense social and kin network, and this close contact between deaf and hearing people resulted in the evolution of a sign language that was widely used by both deaf and hearing people in a number of villages on the island on a daily basis, down the generations. Changes in marriage patterns, due to processes of immigration and emigration of both deaf and hearing people, led to the result that deafness on the Vineyard died out.[8]

Martha's Vineyard became an especially powerful part of the "collective memory" of the international deaf community: when its story is recounted, it often sounds like a paradise for deaf people, who are disappointed when they learn that this "dream" ceased to exist after the mid-twentieth century. It might be tempting to imagine shared signing communities as deaf utopias, environments where deaf people can thrive and where perspectives of Deaf Gain can flourish. The reason that deaf people tend to see this place—and possibly also other, similar places—as if it represents "an idyllic opposite to the Deaf communities of Europe and North America"[9] is that Western societies have struggled for a long time to achieve successful inclusion of deaf people within mainstream society. The reality for the majority of signing deaf people is growing up in hearing nonsigning families, having hearing nonsigning teachers and colleagues, and having to comply with a hearing nonsigning society. Scottie Allen has therefore described signing deaf people as constituting a geographical diaspora, yearning to be together and to use sign language whenever they want to, leading them to imagine ideal places such as Martha's Vineyard.[10]

In addition to recalling and retelling the true story of Martha's Vineyard, there are many examples of fairy tales and fantasy stories in which deaf people imagine such ideal worlds. Examples are tales in which the roles are reversed, such as in "Eyeth," the story about a planet where deaf signing people constitute the dominant majority and hearing speaking people the oppressed minority.[11] Other stories fantasize about determined efforts to *create* such a deaf majority: in his satirical book *Islay*, Douglas Bullard writes about the attempts of a deaf man called Sulla to take over a small state in order to constitute a deaf majority there, with the aim of living in harmony with a hearing minority.[12] Cynthia Peters compares Sulla with Moses, who leads his people to the Promised Land.[13]

Such ideas have not been confined to the realms of story or fantasy alone: sometimes, actual plans were devised. A well-known and classic example is the nineteenth-century discussion between deaf Americans Edmund Booth and John Flournoy about the Deaf Commonwealth, a state with its own government where all the citizens would be deaf.[14] Similar separatist plans were discussed in British and French deaf communities.[15] A more recent example is the plan to establish a town for sign-language users in South Dakota called Laurent.[16] It is easy to

imagine such imagined communities as places where both practices and perspectives of Deaf Gain would get ample space to develop, because of the geographical proximity of deaf people, the pervasiveness of sign-language use, and the fact that visual communication would be the standard rather than the exception. Yet all these efforts failed for practical reasons, such as a lack of funding or not having enough followers.

Martha's Vineyard and other shared signing communities are different from all of these imagined examples for two reasons: they are neither immigrant colonies, such as a Chinatown or Little Italy, nor separatist groups that isolate themselves from mainstream culture, like the Amish. Instead, they are places where, even though deaf people have constituted a minority rather than a majority, sign language has been an integral part of the local linguistic mosaic. This situation evolved spontaneously and naturally, rather than in an imagined or planned way. Therefore, we can consider these places in the frame of Deaf Gain, because of their contribution to diversity between human communities.

In this chapter, I will fluctuate between descriptions of internal and external perspectives, the former being the perspectives and practices of the inhabitants of shared signing communities, and the latter being the perspectives of people living or originating "outside" the communities, who are typically situated in an environment that is less deaf-friendly and where sign-language use is less pervasive.

Another essential distinction is the one between the earlier-mentioned intrinsic and extrinsic values. Within the communities, it appears that intrinsic arguments often occur, and that they occur more often than extrinsic arguments of Deaf Gain (moreover, the former do not automatically imply the latter). Reports of common discourses and ideas held by both deaf and hearing people in shared signing communities seem to reflect the Deaf Gain concept's emphasis on human diversity (that is, intrinsic arguments). To speak of Deaf Gain, it is sufficient to recognize deafness as a biological variety in the human race, like skin color or gender. For example, after undertaking interviews with surviving hearing members on Martha's Vineyard, Nora Groce reported that being deaf was seen as "pretty normal," merely a human variation such as eye color.[17] Also, the idea that deaf people make specific contributions to humanity (that is, extrinsic argument) has been reported in at least two shared signing communities: in Bengkala and Adamorobe, deaf people are regarded as particularly hard workers and good fighters.

While describing internal Deaf Gain perspectives, I will necessarily take a critical and nuanced position when discussing the concept with regard to shared signing communities. For example, Groce's account is historical, and Barry Crouch strongly criticizes Groce's "glorification of the past."[18] Likewise, contemporary shared signing communities are (naturally) not what could be called deaf utopias.[19] When investigating daily life in such communities, the picture that emerges is naturally ambiguous. In addition to the aforementioned Deaf Gain perspectives, other reported discourses or practices reflect the idea that deaf people are

deficient or less capable than hearing people. In some communities, deaf people are struggling to find marriage partners, and in Adamorobe, they are not allowed to marry each other.[20] In addition, there seems to be a kind of setback in most known shared signing communities: in a number of these communities, larger socioeconomic processes and educational and occupational differentiation mean that deaf people are increasingly marginalized. However, although shared signing communities are not a paradise or a dream, they deserve a discussion in the light of the Deaf Gain concept, especially when comparing them with other human communities. These are places where the presence of deaf people is inherent to the communities and where hearing people have experiential knowledge about deaf people and sign language. Hence, particular practices and ideas that seem to be utopian in the majority of the world seem to be a matter of course in most (if not all) shared signing communities, such as the practice of using sign language automatically with a deaf person, or the commonsense nature of the knowledge that one can discuss everything in sign language. Thus, even if oppressive and marginalizing discourses, practices, and processes are present, the very existence of shared signing communities highlights the human ability to adapt, on a community-wide basis, to human difference.

This discussion might give the impression that I regard shared signing communities as a particularly distinctive kind of community. Instead, I describe them, rather than as existing in a cultural vacuum, as existing on a continuum with the societies surrounding them (and with human communities in general). The high rate of genetic deafness in shared signing communities is often not a phenomenon isolated within these communities but one that is spread throughout a wider geographical area, leading to the emergence of several shared signing communities (with varying numbers of deaf inhabitants) of which only one community (typically the one with the most deaf inhabitants) became well known and well researched. Also, there seems to be a continuum in signing: it appears that the known shared sign languages typically arose in gesture-prone environments, where people started to produce rural home sign languages, which then evolved to shared sign languages over time.

In the remainder of this chapter, I first lay down the main features that seem to define shared signing communities, outlining sociocultural patterns that they seem to have in common. Next, I discuss shared sign languages as languages existing on a continuum of signing. Subsequently, I set out on internal ambivalent discourses about deaf people and deafness in shared signing communities, which seem to include both Deaf Gain perspectives and more "negative" perspectives. From there, I focus on the aforementioned view of deaf people as strong fighters and workers. In the conclusion, I summarize how the Deaf Gain concept can be applied to practices and discourses in shared signing communities.

Defining Shared Signing Communities

Shared signing communities have been reported in about twenty locations in Middle and South America, Asia, the Middle East, and Africa.[21] There is considerable variation among the communities with regard to sign-language knowledge and use, deaf people's marriage rates, deaf people's participation in village economies and politics, and the role and results of deaf education. Traditionally, the common factors among these communities (factors which are changing in a number of communities) seem to be the high degree of kin relationships in the groups or locations, traditionally labor-intensive and often subsistence-oriented economies, and low degrees of differentiation between deaf and hearing people as regards level of education and occupation.[22] Most basically, what sets these communities apart is the use of a shared sign language between deaf and hearing people due to a high prevalence of hereditary deafness, mostly caused by a recessive gene (though a dominant gene is also possible).[23] The typical percentage of babies born deaf in the West is about 0.1 percent,[24] and this percentage is believed to be higher in developing countries. For example, Richard Biritwum and colleagues found that 0.46 percent of 2,566 children in Ghana's Central Region were deaf.[25] Recent figures (at different times) from shared signing communities are shown in the adjacent table.

The percentage of deaf inhabitants in shared signing communities varies and can change considerably over time. The percentage (not to be confused with the absolute number of deaf people) also seems to decline in a number of communities, especially in places with rapid immigration (such as in Adamorobe). Numbers of hearing inhabitants naturally increase much more rapidly than numbers of deaf inhabitants, because of births and immigration. Sometimes deaf people move to other areas, such as in Bengkala and Adamorobe. Sometimes the number of deaf people is significantly lower than the average number in developing countries (such as in Ban Khor).

However, the exact numbers (relative or absolute) of deaf people in such communities do not say much in themselves. Rather, it is the communities' *social atmosphere* that creates the possibility for a shared sign language to emerge and to spread and be passed on throughout a community, especially when the deafness exists for a number of generations.[26] Through endogamous marriages, not only is a "deaf gene" passed on in a community but also there emerge a dense social and kin organization and collective culture (not necessarily concomitant with geographical isolation) in which the deaf and hearing people are likely to have considerable contact with each other, thus circulating the evolving sign language and the deaf-inclusive way of living widely throughout the community and transmitting it down through the generations. Because deaf and hearing people in shared signing communities do (or did in the past), to a large extent, the same

things in daily life and frequently engage in common activities, situations arise in which there is exchange of greetings, news, and knowledge and other ways of social contact through sign language. This does not mean that shared sign languages exist for centuries: many of these sign languages "tend to arise suddenly, spread rapidly, and disappear quickly."[27] Most examples in this chapter come from larger shared signing communities, with a certain degree of consistency through time, where ethnographic research has been conducted. From this viewpoint, the best-

TABLE 17.1 DEAF INHABITANTS IN SELECTED SHARED SIGNING COMMUNITIES

Community	Year	Number of deaf/ hearing inhabitants	Percentage of deaf inhabitants
Bengkala (Indonesia)	2000	47 / 2,180	2.16
	2008	46 / 2,740	1.68
Ban Khor (Thailand)	2009	16 / 2,741	0.58
Al-Sayyid Bedouin (Israel)	2008	120 / 3,700	3.24
	2012	130 / 4,500	2.89
Adamorobe (Ghana)	2001	35 / 1,356	2.58
	2012	41 / 3,500	1.17

Note: The number of deaf people in Bengkala in 2008 would be 38 with deaf emigrants excluded. The number of deaf people in Adamorobe in 2012 would be at least 52 with deaf emigrants included.

Sources: Numbers for Bengkala for 2000 are from I Gede Marsaja, *Desa Kolok: A Deaf Village and Its Sign Language in Bali, Indonesia* (Nijmegen, Neth.: Ishara Press, 2008); and for 2008 are from Connie de Vos, "The Kata Kolok Perfective in Child Signing: Coordination of Manual and Non-manual Components," in *Sign Languages in Village Communities: Anthropological and Linguistic Insights,* Sign Language Typology Series 4, ed. Ulrike Zeshan and Connie de Vos (Berlin: Mouton de Gruyter and Ishara Press, 2012), 127–52. Information for Ban Khor is from Angela Nonaka, "Estimating Size, Scope, and Membership of the Speech/Sign Communities of Undocumented Indigenous/Village Sign Languages: The Ban Khor Case Study," *Language and Communication* 29 (2009): 210–29. For Al-Sayyid bedouin, information for 2008 is from Shifra Kisch, "'Deaf Discourse': The Social Construction of Deafness in a Bedouin Community," *Medical Anthropology* 27 (2008): 283–313, and for 2012 is from Kisch, "Demarcating Generations of Signers in the Dynamic Sociolinguistic Landscape of a Shared Sign-Language: The Case of the Al-Sayyid Bedouin," in Zeshan and Vos, *Sign Languages in Village Communities,* 87–125. For Adamorobe, numbers for 2001 are from Victoria Nyst, *A Descriptive Analysis of Adamorobe Sign Language (Ghana)* (Utrecht, Neth.: LOT, 2007), and data for 2012 are from Annelies Kusters, "Adamorobe: A Demographic, Sociolinguistic, and Sociocultural Profile," in Zeshan and Vos, *Sign Languages in Village Communities,* 347–51.

researched examples are Bengkala in Bali, the Al-Sayyid bedouin in Israel, Ban Khor in Thailand, and Adamorobe in Ghana.[28]

Most scholars write that the use of shared sign languages facilitates deaf people's "integration," which is a term that has been criticized in disability and minority discourses, because it suggests the assimilation or normalization of an "abnormal" person into a "normal" community; deafness is a difference that is "ironed out." The discourse of assimilation essentially excludes a Deaf Gain perspective, in which diversity is accepted or celebrated. A more adequate choice of words is to describe shared signing communities as *cohesive* communities where the fact that deaf and hearing people live together is integral to these people's habitus. *Habitus* is a term that Pierre Bourdieu uses to suggest that people's strategic practices are structured by the sociocultural environments they live in.[29] The term *habitus* has been used with regard to shared signing communities by Jan Branson and colleagues[30] and by Angela Nonaka, who writes, "A speech/sign community's [i.e., shared signing community's] dimension of moral habitus is generative of and generated by the creation, spread, maintenance, and above all, the use, of the village's Sign Language and is reflected in the local social construction of deafness."[31] Shifra Kisch makes a similar point when noting hearing people's "experiential knowledge, grounded in daily experiences and practices."[32] Using the term *habitus* does not necessarily imply that deaf people in shared signing communities are included in every aspect of the village's public, political, and religious life, which is seldom the case.[33] Yet it does reflect the fact that shared signing communities are not just villages and towns with a high number of deaf people but places where deaf people and deafness are *situated* and where life between deaf and hearing people is, to a high extent, *shared*, as are the sign languages used between them. For example, in my study of Adamorobe, although both deaf and hearing people reported general differences between deaf and hearing people, the final or overall emphasis in interviews and informal conversations lay on sameness and connection. Hearing respondents uttered statements such as these: "Deaf and hearing in Adamorobe have a cordial relationship. We do everything together nicely. We eat together, farm together, almost everything"; "We have been with them since time immemorial and we will be with them until the end"; "Our great grandfathers and -mothers were deaf ancestors"; "Communicating with deaf people is what our ancestors did." These quotes emphasize that the presence of deaf people in Adamorobe, as well as the unity of deaf and hearing people as one people or one family, is embedded in Adamorobe's habitus, in the past, present, and future.[34]

The Sociolinguistic Contexts of Shared Sign Languages

When we consider the Deaf Gain concept with regard to shared signing communities, it is important to realize that the natural and pervasive use of visual-gestural communication between deaf and hearing people is no isolated phenomenon in these communities. As I mentioned earlier in this chapter, a high prevalence of

hereditary deafness is often spread over several villages or groups in the same region, of which typically only the community with the most deaf individuals became well researched. In some cases, the shared signing community is locally known as "deaf village."[35] Examples of groups or areas with several pockets of hereditary deafness are Martha's Vineyard, Providence Island in the western Caribbean, Bengkala and environment, the Negev bedouin, and the Yucatec Maya.[36] Branson, Don Miller, and I Gede Marsaja, for example, found several villages containing between five and eighteen deaf inhabitants in the environment of Bengkala, where the same sign language was used as in Bengkala itself.[37] Eighteen people is a number comparable to the total figure in Ban Khor and Chican, a Yucatec Mayan shared signing community. Kisch mentions two descent groups, both of the Qderat alliance, with incidences of deafness similar to the Al-Sayyid, and a shared sign language was used among the Qderat as well.[38] It is not clear to what extent this language resembles the language used among the Al-Sayyid. Olivier Le Guen and Erich Fox Tree, respectively, described Yucatec Mayan Sign Language, or Meemul Tziij, as a language used throughout a geographical area,[39] as opposed to Cesar Ernesto Escobedo Delgado, who calls it Chican Sign Language, after the village with the most deaf inhabitants in this area.[40] Also, in the environment of Adamorobe there were some small villages in the rural, cocoa-growing area around Aburi (a town 4 km from Adamorobe), where a high rate of deafness occurred and a local sign language similar to Adamorobe Sign Language was used, although the lexicons differed somewhat.[41]

It is the case not only that shared signing communities seem to come in clusters but also that they seem to be located in areas that are gesture-prone and accommodating to manual communication, where often both deaf and hearing people are productive members of their communities. It is difficult (if not impossible) to draw a sharp line between shared signing communities and villages in gesture-prone environments where, for example, two or three deaf inhabitants lead productive lives and communicate with hearing people through conventional gestures or home signs. For example, Victoria Nyst, Kara Sylla, and Moustapha Magassouba created a corpus containing signing of deaf people in various types of rural communities in Mali: signing in villages with a high incidence of non-hereditary deafness (different from shared signing communities, where deafness is hereditary and typically multigenerational); the signing of fluent and less fluent home signers (using what Nyst, Sylla, and Magassouba call rural home sign languages), which is used in gesture-prone environments; and a family sign language (used by five deaf people, with three generations of hereditary deafness).[42] They report that in all these situations, hearing family or other community members readily interact with deaf people using signs; that there is no stigma attached to sign-language use or gesture use; and that deaf people participate actively in community and family life. Similarly, Jill Jepson investigated Indian villages where deaf people used rural home sign languages with people in their environment,

based on iconic and indexic signs, pantomime, and commonly used gestures, which showed a certain amount of consistency throughout different villages and which she therefore called Rural Indian Sign Language.[43] This is reminiscent of Constanze Schmaling's account of the Hausa in Kano State in Nigeria, an area with a high incidence of deafness, where deaf people regularly meet and a local sign language emerged called Maganar Hannu. Schmaling reports that many hearing Hausa people know Maganar Hannu or can communicate through gesture, and that deaf people are farmers, crafts specialists, and small-scale traders, just like many local hearing people.[44] In summary, what is reported time and again is the automatic acceptance of visual-gestural communication, and also the fact that speech is neither expected from nor forced on deaf people. We could conceive of such different sociolinguistic settings as existing on a continuum rather than as whole different kinds of communities. I suggest that some shared signing communities exist on the far end of a continuum because of the development of the language, whereas others simply became well known because researchers "found" and researched them.

In the aforementioned gesture-prone environments, the signing and gesturing of *hearing* people seems to be the main language input leading to the emergence of rural home sign languages and shared sign languages: hearing people constitute the majority of users of the languages and are key to language transmission and language structure.[45] Shared sign languages are used by a high number of hearing users, who are submerged in mixed deaf–hearing sociolinguistic contexts, and seem to have different structural characteristics from the sign languages used by mainly first-language users in large (often urban and/or national) deaf communities, arising in mostly deaf contexts such as schools for the deaf. Examples of characteristics typical for shared sign languages are the use of relatively few different hand shapes; a large signing space heavily making use of pointing to real locations for person and place reference (based on shared knowledge of places and persons' homes); a high degree of macrofunctionality (that is, one sign can have many different meanings according to the context in which it is used); and the absence (or infrequent use of) classifier verbs and simultaneous constructions. Nyst remarks that, as such, these languages are maximally adjusted to the communities that use them, namely, user communities with more hearing than deaf signers, with various levels of language proficiency. Simultaneous or complex iconic structures would be more difficult to learn and produce for hearing users.[46]

The preceding discussion leads to a new question with regard to Deaf Gain. Bauman and Murray regard the existence of sign languages as an example of Deaf Gain[47] (although sign languages have also been known and used by hearing people only or mostly, such as the aboriginal sign languages described by Adam Kendon).[48] If a rural (home) sign language, family sign language, or shared sign language is so much a *common* product of deaf and hearing people—that is, it is created by deaf and hearing people together, rather than created by deaf people

among themselves and then passed on to hearing people—can the emergence of this language be called an example of Deaf Gain? If there were no deaf people, the deaf–hearing inclusive atmosphere in these communities would not have come into existence, and neither would have most of the shared sign languages that are used. In this respect, we could see the emergence of such sign languages as an example of Deaf Gain, contributing to linguistic diversity.

Early in the chapter, I mentioned the distinction between internal and external perspectives of Deaf Gain (not to be confused with intrinsic and extrinsic values). The preceding discussion is an external view that does not necessarily correspond with the perspectives held by people in shared signing communities. On the one hand, language attitudes and ideologies in shared signing communities seem generally to be in favor of shared sign languages.[49] For example, in Adamorobe, people have experiential knowledge that everything can be said in both Akan (the local spoken language) and Adamorobe Sign Language. On the other hand, it is not clear whether, in shared signing communities, the sign languages that emerge are seen as contributing to a diverse linguistic mosaic (in other words, whether there are internal "intrinsic Deaf Gain arguments" present with regard to shared sign languages) or whether they are seen as just a practical means to communicate between deaf and hearing people. Most shared sign languages are on the brink of extinction, because an increasing number of people (typically children and youth in or following deaf education) use an urban or national sign language with each other, rather than the shared sign language.[50] Another question is whether there is a stronger sense of Deaf Gain in the shared signing communities with a lot of deaf inhabitants and an established shared sign language than in those other areas where deaf people also communicate manually, through gesture and rural home-sign languages. This question leads us to the next section: beliefs and attitudes with regard to the high prevalence of deafness in shared signing communities.

Ambiguous Beliefs and Attitudes with Regard to Deafness and Deaf People

Usually only a few individuals with a disability are present in small communities, which makes it difficult to identify internal discourses about specific disabilities (such as deafness) in a structural way,[51] but shared signing communities are obviously different in that respect. A diverse range of discourses explaining deafness or giving a place to deafness in shared signing communities has been reported. It appears that in these discourses, perspectives of Deaf Gain are alternated by other, "negative" perspectives. For one, deafness is often said to be part of human or natural diversity. For example, in Bengkala and its surrounding villages with a high prevalence of deafness, "a deaf child is part of the diversity of nature."[52] In Adamorobe, it is often said that deafness is natural.[53] Another example is the earlier-mentioned quote from Martha's Vineyard that deafness is like eye color; and in 1895, a reporter found that the people there, "strange to say, seem to be

proud of the affliction—to regard it as a kind of plume in the hat of the stock."[54] In addition to the general diversity/nature argument, the high rate and generational depth of hereditary deafness in shared signing communities has been explained in several locally specific ways. In Bengkala, deafness is attributed to a deaf god and a deaf ghost. The shrine of the deaf god is shared with some surrounding villages with a relatively high number of deaf inhabitants, who also see the god as the cause of deafness.[55] The ghost story is about a terrible, horrifying deaf ghost at the cemetery who gave a childless couple a baby, who became the first deaf man of Bengkala.[56] In Ban Khor, a story was reported about a man torturing a crow before fathering the first deaf children in the village, as such deafness is connected to bad karma.[57] Among the Al-Sayyid bedouin, several explanations exist: deafness was brought into the families by brides from outside the community; is due to variations in men's seed; is due to someone causing deafness in the baby in the womb; or is "from Allah."[58] In Adamorobe, deafness is explained in historical stories about a war, a handsome deaf farmer, and a disobedient ancestor; in stories about deaf and hearing deities and spirits that live in and around two rivers in the outskirts of the village; and in linkages with occurences in personal relationships (witchcraft, curses, contagion), with natural or hereditary causes (having deaf parents), or with God. In these stories and discourses in Adamorobe, deafness is sometimes regarded as a gift related to certain strengths of deaf people (see next section), although most of the time it is explained as a punishment.[59]

In Adamorobe, the stories and discourses are maintained separately in countless different versions, but at the same time they are entangled with each other into a highly complex web of explanations.[60] Kisch reports that also among the Al-Sayyid bedouin, people negotiated the origins of deafness in a dialectical way: they raised a variety of possibilities, challenged explanations with other explanations, and turned up new versions: "People extract their explanations from the rich pool of perceptions and explanation patterns to which they are exposed. People modify the use of several explanations anchored in different dimensions of social life and discourse, and they sometimes choose conflicting ones. They make creative use of them in different contexts, while negotiating their contents."[61] Kisch examines these discourses "as a practice and not merely as a key to cultural representations," asserting that "language and reasoning are not merely reflections of beliefs of ideas; they are modes of action."[62] The discourses explaining deafness cannot be laid down in a consistent and seamless theory, but there is consistency in being constantly in the process of giving a place to deafness, a place that is not fixed but negotiated and renegotiated in ambiguous ways.

This perception of ambiguity is caught well in Irene Taylor's account of Jhankot, a shared signing community (or rural home sign-language community) in Nepal: "As I travelled that mountainside and into Jhankot, I saw only grays: that to define deafness as something that *is* or *is not*, as something that is *good* or *bad*, is to limit and distort the experience."[63] *Ambiguity* denotes that language or actions are

susceptible to more than one interpretation or more than one meaning. Donald Levine criticizes social scientists for trying to "fix" ambiguity in one-dimensional terms such as *deviance, anomaly,* and *taboo* and for thereby actually "[taking] flight from ambiguity," missing the fact that "people have mixed feelings and confused opinions, and are subject to contradictory expectations and outcomes."[64] Sjaak van der Geest opines that writing about ambiguity is both "the art and the frustration" of the profession of anthropology.[65]

A high degree of ambiguity is characteristic in historical and anthropological literature with regard to discourses and attitudes surrounding disability (and also with regard to gender, sexuality, and ethnicity). Examples of integration and exclusion and positive, neutral, and negative perceptions, discourses, and attitudes with regard to disabilities seemingly go hand in hand. For example, some Tanzanian proverbs about disability reflect dislike and cruelty, whereas others reflect acceptance and support.[66] Because of the high degree of ambiguity surrounding disability, Patrick Devlieger described handicap or disability as an interstitial category between existing categories.[67] Devlieger and Sophie Dalle-Nazébi each write, about disabled and deaf people in Congo, that they are integrated and not marginal yet liminal—thus normal and abnormal at the same time—with a right to develop.[68] This perspective also seems to be characteristic of shared signing communities, not only of communities where there are only a few inhabitants with specific disabilities.

Earlier I listed some etiological discourses in shared signing communities, which should not be confused with attitudes. Benedicte Ingstad warns that beliefs and attitudes are often confused, and the interconnection between "bad causes" of disabilities and "bad attitudes" toward people with disabilities might be less strong than some authors seem to suggest. An attitude can be defined as "a statement about a disposition to act toward a person, group, or object."[69] Nonaka states that attitudes toward sign language and deafness in shared signing communities are typically "neutral to positive."[70] For example, Groce emphasized the fact that the deaf people on Martha's Vineyard were not seen as "handicapped": "They were just deaf,"[71] and "[t]here was nothing at all unusual about them."[72]

However, a closer reading of the available literature teaches us that ambiguity looms not only in discourses about deafness such as these but also in attitudes toward deaf people in daily life. For example, James Woodward conducted a quantitative analysis of attitudes toward deaf people on Providence Island in the western Caribbean and reported generally positive attitudes about the intelligence, maturity, and mental health of these people.[73] William Washabaugh, by contrast, describes elaborately how hearing people on Providence Island either ignored the deaf or behaved overtly paternalistically toward them, treating them as second-class citizens and assigning them domestic tasks that were usually done by children. Furthermore, deaf people were insulted by children, practical jokes were played at their expense, and they were the victim of sexual assaults or conquests.

At the most fundamental level, deaf people were not involved in conversations, nor did they interrupt or ask for involvement: "The deaf are more frequently informers and less frequently the informed. The deaf are the requested, rarely the requestors. The deaf are frequently the laughed at persons and less frequently the laughing."[74] Another example: Branson and colleagues reported that hearing people in Bengkala did not regard the deaf villagers as less intelligent but also stated that deaf people were teased because of their deafness. They emphasize that this is not abnormal or unusual: "The Balinese have a reputation for poking fun at each other, for laughing at misfortune and for highlighting peculiar physical characteristics in nicknames and name calling."[75] John Hinnant, however, wrote that deaf people wanted to be hearing because of the teasing, thus suggesting that it was clearly not appreciated.[76]

Summarizing these points, the perspective of Deaf Gain gets a place in a picture of ambiguity, as it is not the only perspective on deafness and sign language that is present in shared signing communities (or in human communities at large). First, deafness is seen as part of natural diversity, which seems to point to an intrinsic argument for Deaf Gain. Second, sometimes deafness is explained and/or perceived as an affliction. This discourse seems to parallel the "hearing loss" discourse in the West and thus seems to be the opposite of the Deaf Gain concept. In shared signing communities, it appears that these conceptions, which we naturally regard as opposites, go hand in hand. Still, it might be that deaf people's perceptions differ from those of the hearing and more strongly point in the direction of Deaf Gain. This is the case in Adamorobe, at least: during the process of negotiating discourses to explain deafness, deaf people more often favored "positive" causes of deafness than hearing people did, such as the argument that deafness was a gift of God and not inflicted upon them by a witch.[77] Third, in some shared signing communities, deaf people are regarded as bringing particular contributions to diversity, which seems to point to an extrinsic argument for Deaf Gain. This perspective will be discussed in the next section.

Extrinsic Arguments of Deaf Gain, and the Marriage Law in Adamorobe

In Bengkala, deaf people are said to have strong muscles because of the heavy manual labor they carry out, and therefore they are particularly active in village activities that require physical strength. Digging graves for the deceased and carrying dead bodies or cremation towers are also tasks for deaf people, who are believed to be able to sign with supernatural beings at the cemetery and to be braver than hearing people. Because of this acclaimed strength and bravery, there are deaf people present in the civil defense of the village. Deaf people in Bengkala are trained in martial arts, for personal defense and occasional performance but also as the basis of membership in this village guard. They are "associated with the security of the entire village, as thieves and burglars are too scared to enter the village due to the vigilance of the [deaf people]."[78]

Similarly, in Adamorobe, both deaf people and a majority of interviewed hearing people emphasized that deaf people are stronger than hearing people, and that they are better and fiercer fighters and harder-working farmers. In the past, there were deaf town guards to guard the village at night to prevent strangers from entering the place. Deaf people also fulfilled an active role as warriors in the past, and during certain confrontations with a neighboring ethnic group, deaf men stood on the front line. The value of being strong farmers and fighters is reflected in the aforementioned historical stories that explain the presence of deaf people in Adamorobe. One story goes that once there was a young, strong deaf farmer whom every woman wanted to marry because of his hard working, and that he was invited by the founders of Adamorobe to "breed" more deaf people. There are also stories about an important war in Akantamansu, in which bush animals became human to fight along with the warriors from Adamorobe, and afterward remained in Adamorobe as deaf-mute human beings.[79]

In conversations and interviews with deaf and hearing people in Adamorobe, they were asked why they thought that deaf people were better farmers and fighters. It appeared that deaf people were thought to have certain psychological characteristics: deaf people were not lazy, focused better than hearing people on what they did, acted "from the bottom of their heart" and reacted fast, and were unambiguous and did not like to change their minds. According to these interlocutors, this meant that one could count on a deaf person, but also that deaf people could be very stubborn, inflexible, unyielding, unforgiving, and difficult to convince. It was also said that deaf people were confident, brave, not shy, and not submissive. Hearing people sometimes complained about deaf people's short-temperedness and truculence and said that this "uncontrollable behavior" made them "difficult to discipline" and difficult to separate or stop during a fight. Deaf people themselves, however, put strong emphasis on the positive virtues of their assertiveness, and also on honesty, sincerity, and consistency. They criticized hearing people for not aiming for these values as much as they do: hearing people were often said to be dishonest cheaters and pretenders.[80] Deaf people implied that hearing people would benefit by being more like deaf people, which is, in my eyes, an extrinsic argument of Deaf Gain.

The fact that deaf people were found to be blunt or black-and-white in their opinions was reported on Martha's Vineyard, too: when there were town meetings and a deaf person wanted to comment on something, someone would voice for him, but "the person voicing tended to temper the message. He wouldn't sound as angry or use quite as strong a vocabulary in his interpretation."[81] Moreover, the belief that deaf people are hardworking is not unique to Adamorobe and Bengkala. For example, Devlieger remarks that "begging is not a common practice among deaf people [in sub-Saharan Africa], who are known to be hard-working and sometimes possessing special skills."[82] Michele Friedner reports that deaf people are

recruited by Indian coffee chains, because they are believed to be hardworking and to make better coffee than hearing people.[83]

In Adamorobe, both deaf and hearing people see a connection between some of these supposed characteristics of deaf people and discrimination. Deaf people who were especially well known for starting a fight or a heated argument when they thought they were mocked or insulted for their deafness explained that it was a necessity for deaf people in a hearing environment not to let insults pass, so that people would not even think about offending them again. Fighting when hearing people insulted them was thus a way to command respect. Concurring with this opinion, two hearing interviewees thought that God had given the deaf people this special strength "so that no one can bully them."[84] Some characteristics that are described as Deaf Gain thus could have a cause in oppression.

Unfortunately, recognizing and/or emphasizing Deaf Gain does not automatically imply that deaf people can thrive in ways equal to hearing peers, or that its effect lasts in changing societies. In Adamorobe, for example, it appears that, in the past, such "deaf-specific strengths" were appreciated and valued more than now. Formerly, guarding was undertaken by deaf villagers rather than by trained policemen. The deaf town guards thus had important roles. Today, there are only hearing town guards who are trained by the police, and deaf people are excluded from physical confrontations with neighboring groups. Also, although deaf people's farming skills and hard labor are still valued today, farming by the deaf was at one time almost their sole occupation, whereas today it is regarded as a way of life that cannot make money. Deaf people described not only feeling enabled at their farms but also feeling limited in economic opportunity and life standard. We could say that the discourse of their being harder and better workers than hearing people is an example of Deaf Gain, but we also could say that in a way this discourse "locks" them into repeatedly doing this work; it keeps them in place.[85] In Bengkala, deaf people belong to the poorest of the village, because the hard day labor they carry out does not yield much income.[86] Similarly, Friedner reports that deaf workers in Indian coffee chains meet with a glass ceiling and are laid off when they are "too old," as those coffee chains like to maintain a youthful image.[87]

In their article about Deaf Gain, Bauman and Murray discuss the nineteenth-century transatlantic debate about the idea that deaf people should not marry other deaf people in order to avoid producing deaf offspring. Bauman and Murray argue that "deaf people may be seen through a lens of human diversity and, therefore, worth valuing as they are, without recourse to 'normalization.'"[88] However, in Adamorobe, the question "Why should deaf people and their sign languages continue to exist?" is as topical as it is in the Western world; the "interaction between Deaf ways of living in the world and larger social discourses, some of which seek to redefine or eliminate these ways of living," is as relevant as elsewhere.[89] Since 1975, a local law in Adamorobe has prevented deaf people from marrying

in order to avoid producing deaf offspring. So, although intrinsic and extrinsic values of the presence of deaf people (and thus of Deaf Gain) are recognized, this does not lead to the preservation of deaf people (which seems to be the central concern in Bauman and Murray's account). As far as I know, no similar marriage prohibitions exist in other shared signing communities, although in some of them, deaf people have a hard time finding marriage partners or are discouraged from forming unions which could result in deaf offspring.[90] In Adamorobe, the prevailing view among nineteen interviewed hearing people seemed to be that the deaf people who were already there were accepted as part of Adamorobe but that any new deaf people should not be "produced" if it could be stopped or avoided. The respondents took an accepting attitude only toward cases of deaf offspring of hearing parents, which were regarded as "uncontrollable" and "from God or nature." Deaf–deaf marriages, by contrast, were believed to bring forth deaf children only, were controllable, and thus should be prohibited.[91]

Conclusion

In this chapter, I have discussed language practices and discourses in shared signing communities in the light of the Deaf Gain concept. I have described both internal perspectives, held by people in the communities, and external perspectives, embedding shared signing communities in a global context. I have also identified discourses about intrinsic values (deaf people as *part of* human diversity) and extrinsic values (deaf people as *contributors to* human diversity).

I have reported on a variety of internal discourses surrounding deaf people and deafness, a number of which seem to correspond with the meaning of Deaf Gain. Intrinsic arguments that deaf people contribute to diversity just by being (biologically) different seem common, yet extrinsic arguments also have been reported, such as that deaf people are hard workers and brave fighters.

Although internal perspectives of Deaf Gain can be identified, they do not necessarily lead to preservation of deafness or to a standard of living comparable to hearing people's. In addition, negative or discriminating discourses and attitudes toward deaf people and deafness have been reported, along with marginalizing sociohistorical processes of change. The deaf-inclusive habitus in these places is challenged by developments such as urbanization, the switch from subsistence economies to cash economies, immigration, and diversification of employment and education—processes that have the potential to place deaf people in shared signing communities in disadvantaged positions.[92] Finally, shared sign languages are on the brink of extinction.[93] So, although it might initially have been tempting to imagine shared signing communities as deaf utopias (recall the popularity of Martha's Vineyard stories), environments where sign languages and perspectives of Deaf Gain get ample space to develop, the picture is naturally ambiguous. Thus, we can conclude that in shared signing communities, a sense of Deaf Gain coexists with an idea that "deaf people can't" and a recent sense of deaf setback.

From an external perspective, the very existence of shared signing communities and shared sign languages is an example of Deaf Gain, even if a particular community does not accept deaf people as equal or there are oppressive forces or processes at work. What sets these communities apart is that deafness and deaf people are inherent in the habitus of these communities, the shared sign languages part of their linguistic mosaics. Hearing people have experiential knowledge about sign language and deaf people. Deaf people typically are (or were) productive members of these communities.

In summary, ambiguity seems to be the key idea, and shared signing communities exist on a continuum with similar or surrounding (as well as all other human) societies. Naturally, these communities do not exist in a cultural or historical vacuum; they are places subjected to the very same trends that have spurred Bauman and Murray to coin the term *Deaf Gain*. There is a need to recognize and study the complex, ambiguous contexts in which practices and discourses that could be described as Deaf Gain appear.

Notes

1. H-Dirksen L. Bauman and Joseph J. Murray, "Deaf Studies in the Twenty-First Century: 'Deaf Gain' and the Future of Human Diversity," in *Oxford Handbook of Deaf Studies, Language, and Education,* ed. Marc Marschark and Patricia Spencer (Oxford: Oxford University Press, 2010), 2:210.
2. Teresa B. Burke, "Bioethics and the Deaf Community," in *Signs and Voices: Deaf Culture, Identity, Language, and Arts*, ed. Kristin A. Lindgren, Doreen DeLuca, and Donna Jo Napoli (Washington, D.C.: Gallaudet University Press, 2006), 63–74.
3. Bauman and Murray, "Deaf Studies in the Twenty-First Century," 222.
4. Shifra Kisch, "'Deaf Discourse': The Social Construction of Deafness in a Bedouin Community," *Medical Anthropology* 27 (2008): 283–313.
5. Shifra Kisch, "Demarcating Generations of Signers in the Dynamic Sociolinguistic Landscape of a Shared Sign-Language: The Case of the Al-Sayyid Bedouin," in *Sign Languages in Village Communities: Anthropological and Linguistic Insights,* ed. Ulrike Zeshan and Connie de Vos, Sign Language Typology Series 4 (Berlin: Mouton de Gruyter and Ishara Press, 2012), 87–125; Angela Nonaka, "Language Ecological Change in Ban Khor, Thailand: An Ethnographic Case Study of Village Sign Language Endangerment," in Zeshan and Vos, *Sign Languages in Village Communities,* 277–312; I Gede Marsaja, *Desa Kolok: A Deaf Village and Its Sign Language in Bali, Indonesia* (Nijmegen, Neth.: Ishara Press, 2008); Annelies Kusters, "Adamorobe: A Demographic, Sociolinguistic, and Sociocultural Profile," in Zeshan and Vos, *Sign Languages in Village Communities,* 347–51.
6. Victoria Nyst, "Shared Sign Languages," in *Sign Language: An International Handbook,* ed. Roland Pfau, Markus Steinbach, and Bencie Woll, Handbooks of Linguistics and Communication Science 37 (Berlin: Mouton de Gruyter, 2012).
7. Kisch, "Demarcating Generations of Signers in the Dynamic Sociolinguistic Landscape of a Shared Sign-Language," 88.
8. Nora Groce, *Everyone Here Spoke Sign Language: Hereditary Deafness on Martha's Vineyard* (Cambridge, Mass.: Harvard University Press, 1985).
9. Bencie Woll and Paddy Ladd, "Deaf Communities," in *Oxford Handbook of Deaf Studies, Language, and Education*, ed. Mark Marschark and Patricia E. Spencer (Oxford: Oxford University Press, 2003), 157.

10. Scottie Allen, "A Deaf Diaspora: Underlying Cultural Yearnings for a Deaf Home" (master's thesis, Gallaudet University, 2008).
11. Ibid.
12. Douglas Bullard, *Islay: A Novel* (Silver Spring, Md.: T. J. Publishers, 1986).
13. Cynthia Peters, *Deaf American Literature: From Carnival to the Canon* (Washington, D.C.: Gallaudet University Press, 2000).
14. Edmund Booth and John J. Flournoy, "Plan for a Deaf-Mute Commonwealth," *American Annals of the Deaf and Dumb* 10 (1858): 40–46.
15. Christopher Krentz, *A Mighty Change: An Anthology of Deaf American Writing, 1816–1864* (Washington, D.C.: Gallaudet University Press, 2000).
16. Monica Davey, "As Town for Deaf Takes Shape, Debate on Isolation Re-emerges," *New York Times,* March 21, 2005, http://www.nytimes.com; "Laurent, SD in Deafweekly," *Deafweekly,* accessed January 23, 2013, http://www.deafweekly.com/backissues/laurent.htm.
17. Groce, *Everyone Here Spoke Sign Language.*
18. Barry A. Crouch, "Martha's Vineyard, 1700–1900: A Deaf Utopia?," *Sign Language Studies* 53 (1986): 386.
19. Annelies Kusters, "Deaf Utopias? Reviewing the Sociocultural Literature on the World's 'Martha's Vineyard Situations,'" *Journal of Deaf Studies and Deaf Education* 15 (2010): 3–16.
20. Ibid.; Annelies Kusters, "'The Gong Gong Was Beaten': Adamorobe; A 'Deaf Village' in Ghana and Its Marriage Prohibition for Deaf Partners," *Sustainability* 4 (2012): 2765–84.
21. Kusters, "Deaf Utopias?"
22. Ibid.
23. Angela Nonaka, "Estimating Size, Scope, and Membership of the Speech/Sign Communities of Undocumented Indigenous/Village Sign Languages: The Ban Khor Case Study," *Language and Communication* 29 (2009): 210–29.
24. William Reardon, Helga Toriello, and Catherine Downs, "Epidemiology, Etiology, Genetic Patterns, and Genetic Counseling," in *Hereditary Hearing Loss and Its Syndromes,* ed. Helga Toriello, William Reardon, and Robert J. Gorlin, 2nd ed. (New York: Oxford University Press, 2004).
25. Richard B. Biritwum et al., "Prevalence of Children with Disabilities in Central Region, Ghana," *West African Journal of Medicine* 20 (2001): 249–55.
26. Kisch, "Demarcating Generations of Signers in the Dynamic Sociolinguistic Landscape of a Shared Sign-Language."
27. Nonaka, "Estimating Size, Scope, and Membership of the Speech/Sign Communities of Undocumented Indigenous/Village Sign Languages," 214.
28. John T. Hinnant, "Adaptation to Deafness in a Balinese Community," in *Genetics and Hearing Loss,* ed. Charles I. Berlin and Bronya J. Keats (San Diego: Singular, 2000), 111–23; Marsaja, *Desa Kolok;* Shifra Kisch, "Negotiating (Genetic) Deafness in a Bedouin Community," in *Genetics, Disability, and Deafness,* ed. John V. van Cleve (Washington, D.C.: Gallaudet University Press, 2004); Shifra Kisch, "Disablement, Gender, and Deafhood among the Negev Arab-Bedouin," *Disability Studies Quarterly* 27 (2007); Kisch, "'Deaf Discourse'"; Kisch, "Demarcating Generations of Signers in the Dynamic Sociolinguistic Landscape of a Shared Sign-Language"; Nonaka, "Estimating Size, Scope, and Membership of the Speech/Sign Communities of Undocumented Indigenous/Village Sign Languages"; Nonaka, "Language Ecological Change in Ban Khor, Thailand"; Kusters, "Adamorobe"; Annelies Kusters, "'Since Time Immemorial until the End of Days': An Ethnographic Study of the Production of Deaf Space in Adamorobe, Ghana" (PhD diss., University of Bristol, 2012); Kusters, "'The Gong Gong Was Beaten.'"
29. Pierre Bourdieu, *An Invitation to Reflexive Sociology* (Chicago: University of Chicago Press, 1992).
30. Jan Branson et al., "Everyone Here Speaks Sign Language Too: A Deaf Village in Bali,

Indonesia," in *Multicultural Aspects of Sociolinguistics in Deaf Communities,* ed. Ceil Lucas (Washington, D.C.: Gallaudet University Press, 1996), 39–57.

31. Nonaka, "Estimating Size, Scope, and Membership of the Speech/Sign Communities of Undocumented Indigenous/Village Sign Languages," 213.
32. Kisch, " 'Deaf Discourse,' " 283–84.
33. Kusters, "Deaf Utopias?"
34. Kusters, " 'Since Time Immemorial until the End of Days.' "
35. Marsaja, *Desa Kolok;* Kusters, "Adamorobe."
36. Groce, *Everyone Here Spoke Sign Language;* William Washabaugh, *Five Fingers for Survival: The Galapagos of Signing* (Ann Arbor, Mich.: Karoma, 1986); Jan Branson, Don Miller, and I Gede Marsaja, "Sign Languages as a Natural Part of the Linguistic Mosaic: The Impact of Deaf People on Discourse Forms in North Bali, Indonesia," in *Storytelling and Conversation: Discourse in Deaf Communities,* ed. Elizabeth A. Winston, Sociolinguistics in Deaf Communities Series 5 (Washington, D.C.: Gallaudet University Press, 1999), 109–48; Kisch, "Disablement, Gender, and Deafhood among the Negev Arab-Bedouin"; Erich Fox Tree, "Meemul Tziij: An Indigenous Sign Language Complex of Mesoamerica," *Sign Language Studies* 9 (2009): 324–66; Olivier Le Guen, "An Exploration in the Domain of Time: From Yucatec Maya Time Gestures to Yucatec Maya Sign Language Time Signs," in Zeshan and Vos, *Sign Languages in Village Communities,* 209–49.
37. Branson, Miller, and Marsaja, "Sign Languages as a Natural Part of the Linguistic Mosaic."
38. Kisch, "Disablement, Gender, and Deafhood among the Negev Arab-Bedouin."
39. Le Guen, "An Exploration in the Domain of Time"; Fox Tree, "Meemul Tziij."
40. Cesar Ernesto Escobedo Delgado, "Chican Sign Language: A Sociolinguistic Sketch," in Zeshan and Vos, *Sign Languages in Village Communities,* 377–80.
41. Kusters, " 'Since Time Immemorial until the End of Days.' "
42. Victoria Nyst, Kara Sylla and Moustapha Magassouba, "Deaf Signers in Douentza, a Rural Area in Mali," in Zeshan and Vos, *Sign Languages in Village Communities,* 251–76.
43. Jill Jepson, "Urban and Rural Sign Language in India," *Language in Society* 20 (1991): 37–57.
44. Constanze Schmaling, "A for Apple: The Impact of Western Education and ASL on the Deaf Community in Kano State, Northern Nigeria," in *Many Ways to Be Deaf: International Variation in Deaf Communities,* ed. Leila Monaghan et al. (Washington, D.C.: Gallaudet University Press, 2003), 302–10.
45. Nonaka, "Estimating Size, Scope, and Membership of the Speech/Sign Communities of Undocumented Indigenous/Village Sign Languages"; Nyst, "Shared Sign Languages."
46. Nyst, "Shared Sign Languages."
47. Bauman and Murray, "Deaf Studies in the Twenty-First Century."
48. Adam Kendon, *Sign Languages of Aboriginal Australia: Cultural, Semiotic, and Communicative Perspectives* (Cambridge: Cambridge University Press, 1988).
49. Nonaka, "Estimating Size, Scope, and Membership of the Speech/Sign Communities of Undocumented Indigenous/Village Sign Languages."
50. Zeshan and Vos, *Sign Languages in Village Communities.*
51. Jessica Scheer and Nora Groce, "Impairment as a Human Constant: Cross-Cultural and Historical Perspectives on Variation," *Journal of Social Issues* 44 (1988): 23–37.
52. Branson, Miller, and Marsaja, "Sign Languages as a Natural Part of the Linguistic Mosaic," 116.
53. Kusters, " 'Since Time Immemorial until the End of Days.' "
54. Groce, *Everyone Here Spoke Sign Language,* 52.
55. Branson, Miller, and Marsaja, "Sign Languages as a Natural Part of the Linguistic Mosaic."
56. Marsaja, *Desa Kolok.*
57. Angela Nonaka, "Emergence of an Indigenous Sign Language and a Speech/Sign Community in Ban Khor, Thailand" (PhD diss., University of California, 2007).
58. Kisch, "Negotiating (Genetic) Deafness in a Bedouin Community."

59. Kusters, "'Since Time Immemorial until the End of Days.'" Discourses about deafness as punishment do not imply a negative attitude toward deaf people in everyday life.
60. Ibid.
61. Kisch, "Negotiating (Genetic) Deafness in a Bedouin Community," 169.
62. Ibid., 168.
63. Irene Taylor, *Buddhas in Disguise: Deaf People of Nepal* (San Diego: DawnSignPress, 1997).
64. Donald N. Levine, *The Flight from Ambiguity: Essays in Social and Cultural Theory* (Chicago: University of Chicago Press, 1985), 9.
65. Sjaak van der Geest, "Ambiguïteit/Ambivalentie: Een inleiding," in *Ambivalentie/Ambiguïteit: Antropologische notities,* ed. Sjaak van der Geest (Amsterdam: Het Spinhuis, 1995).
66. Joseph Kisanji, "Innovations in Developing Countries for People with Disabilities," in *Attitudes and Beliefs about Disability in Tanzania,* ed. Brian O'Toole and Roy McConkey (n.p.: Lisieux Hall Publications in association with Associazione Italiana Amici di Raoul Follereau, 1995), 51–70.
67. Patrick Devlieger, "Handicap/Disability als interstitiële categorie," in *Handicap in intercultureel perspectief: Verkenning rond classificatie, familieleven, en discours,* ed. Patrick Devlieger and Anja De Greve (Schaerbeek, Belg.: PHOS, 1999), 11–31.
68. Patrick Devlieger, "Why Disabled? The Cultural Understanding of Physical Disability in an African Society," in *Disability and Culture,* ed. Benedicte Ingstad and Susan Reynolds Whyte (Berkeley: University of California Press, 1995), 94–106; Sophie Dalle-Nazébi, "Les sourds au Congo-Brazzaville: Entre sorcellerie locale et pratiques occidentals," in *Le handicap au risque des cultures: Variations anthropologiques,* ed. Charles Gardou (Paris: Erès, 2010).
69. Benedicte Ingstad, "Mpho ya Modimo—a Gift from God: Perspectives on 'Attitudes' towards Disabled Persons," in Ingstad and Whyte, *Disability and Culture,* 260.
70. Nonaka, "Estimating Size, Scope, and Membership of the Speech/Sign Communities of Undocumented Indigenous/Village Sign Languages."
71. Groce, *Everyone Here Spoke Sign Language,* 5.
72. Ibid., 8.
73. James Woodward, "Attitudes toward Deaf People on Providence Island," *Sign Language Studies* 18 (1978): 49–68.
74. Washabaugh, *Five Fingers for Survival,* 103.
75. Branson et al., "Everyone Here Speaks Sign Language Too," 41–42.
76. Hinnant, "Adaptation to Deafness in a Balinese Community."
77. Kusters, "'Since Time Immemorial until the End of Days.'"
78. Marsaja, *Desa Kolok,* 72.
79. Kusters, "'Since Time Immemorial until the End of Days.'"
80. Ibid.
81. Ben Bahan and Joan Poole Nash, "The Formation of Signing Communities," in *Deaf Studies IV Conference Proceedings,* ed. Gallaudet University College of Continuing Education (Washington, D.C.: Gallaudet University, 1995), 12.
82. Patrick Devlieger, "Culture-Based Concepts and Social Life of Disabled Persons in Sub-Saharan Africa: The Case of the Deaf," in *The Deaf Way: Perspectives from the International Conference on Deaf Culture,* ed. Carol J. Erting et al. (Washington, D.C.: Gallaudet University Press, 1994), 87.
83. Michele Friedner, "Producing 'Silent Brewmasters': Deaf Workers and Added Value in India's Coffee Cafés," *Anthropology of Work Review* 34, no. 1 (2013): 39–50.
84. Kusters, "'Since Time Immemorial until the End of Days.'"
85. Annelies Kusters, "To the Farm, Again and Again, Once and for All? Education, Charitable Aid, and Development Projects Aimed at Deaf People in Adamorobe, Ghana," in *Signed Languages in Sub-Saharan Africa: Politics, Citizenship, and Shared Experiences of Difference,*

ed. Khadijat Rashid and Audrey Cooper (Washington D.C.: Gallaudet University Press, forthcoming).

86. Marsaja, *Desa Kolok*.
87. Friedner, "Producing 'Silent Brewmasters.' "
88. Bauman and Murray, "Deaf Studies in the Twenty-First Century," 210.
89. Ibid., 213.
90. Kusters, "Deaf Utopias?"; Kisch, "Negotiating (Genetic) Deafness in a Bedouin Community"; Hinnant, "Adaptation to Deafness in a Balinese Community."
91. Kusters, " 'The Gong Gong Was Beaten.' "
92. Shifra Kisch, review of *Talking Hands: What Sign Language Reveals about the Mind,* by Margalit Fox, *Sign Language and Linguistics* 12 (2009): 203–10; Nonaka, "Language Ecological Change in Ban Khor, Thailand."
93. Zeshan and Vos, *Sign Languages in Village Communities*.

18

GAINFUL EMPLOYMENT

Historical Examples from Akron, Ohio

KATI MORTON

The exploration of the emerging theory of Deaf Gain is taking place in the twenty-first century, yet different but compelling Deaf Gain arguments were made historically in early twentieth-century newspapers. Articulated by H-Dirksen Bauman and Joseph Murray, Deaf Gain reframes being deaf from a loss to a gain and suggests multiple ways in which deaf people contribute to the diversity of the world.[1] Historical discussions of this concept are seen in deaf residential-school newspapers, known collectively as the Little Paper Family (LPFs), as well as in general newspapers such as the *New York Times* and the *Washington Post*. Although there are various topics discussed that involve Deaf Gain themes, this chapter will focus on employment, specifically in Akron, Ohio, during the early twentieth century. In the beginning of the 1900s, and particularly during World War I, companies in Akron, most notably Goodyear, sought to hire deaf people in their factories and used Deaf Gain arguments in their advertising for, and praise of, deaf workers. They argued that deaf people were good workers and sometimes even better than their hearing counterparts, and they desired to increase the number of deaf workers in their factories. Following the end of World War I, there is evidence that Goodyear and the Firestone company continued to value their deaf employees and wanted to hire deaf workers, indicating that their Deaf Gain arguments made during the war were sincere, as deaf people were kept in the employ of these factories in the years immediately following the war.

Employment

Deaf Gain discussions found in early twentieth-century newspapers frequently revolved around the subject of employment, including arguments made by hearing employers. They recognized the benefits of hiring deaf people to work for them, and they argued in the press that deaf people were good workers, with some stating they surpassed hearing employees.

Various reasons were offered as to why deaf people were better workers than people who could hear. In a *New York Times* article in 1905, the use of sign lan-

guage was given as the reason deaf workers were more skilled at making telephone parts than those who were not deaf: "It was found that to the making of the delicate mechanism of the modern telephone the deaf-mute by reason of the manual development incident to constant use of the sign language is peculiarly adapted."[2] According to this employer, the use of sign language made deaf people better skilled at making telephones than hearing people. Their use of sign language as a result of being deaf gave them better manual skills and was a gain for this type of work, not a detriment.

Another reason deaf people were considered to be better in certain lines of work regarded a perceived lack of chattiness. One Chicago laundryman in 1923 advertised that he wanted deaf female workers because the women he was currently employing were talking too much: "He made it clear he was not operating a charitable institution but that he wanted workers," showing that he wanted deaf employees because of the benefit he felt they provided. When it was pointed out that deaf people "talk[ed] with their hands," he said they did not do that at work, because then they would have to stop doing their job. He stated, "I have two deaf and dumb women already and they stick to their work. They are worth two of the other magpies." This reveals a perceived gain that an employer believed came from having deaf workers. They were valued because they did not talk with their mouths and thus were preferred over hearing people in this case. The employer recognized that deaf people could communicate, but he believed that because doing so would require them to stop working, they would not do it and thus would benefit him because he was "tired to death of the endless clatter and clack of tongues" of his hearing female employees.[3] Although this employer used language demonstrating a gender bias against women, this example shows that he believed having deaf workers would be a gain for his business, because it would increase productivity.

The argument that deaf people were less talkative was also seen in the *Kentucky Standard* deaf school newspaper (reprinted from the *Silent Worker*), this time regarding barbering. The Deaf Gain argument in this case was that people wanted to have their hair cut in peace and to relax, rather than having a barber constantly talk to them. It was explained that "[T]heir deafness, and consequent lack of loquaciousness while at work, is likely to be looked upon as a positive asset by a considerable number of customers."[4] What could be perceived as a negative trait was turned into a benefit by the deaf newspapers. It was not a loss but a gain, as hearing people could theoretically get their hair cut in silence.

This idea that deaf people were quieter then hearing people, reported in a general newspaper and in a deaf residential school paper, should be examined in the context of its historical period. At this time, it was suggested that by being silent, deaf people could make a contribution to the world and could be used in certain ways, in this case specific areas of employment. The underlying reasons for this argument, particularly as articulated by the deaf school newspaper, deserve to be

further researched. For example, it could have potentially been a way to counteract oralism by showing how not talking was a benefit to society, although whether that was the case requires more examination. Whether or not silence-as-gain can be included in the contemporary frame of Deaf Gain is debatable, but it is an argument regarding the benefits of deaf workers that was made in newspapers during the early twentieth century.

Another factor regarding the employment of deaf people at this time was that of safety. Deaf people knew that employers might regard them as a hazard when laws passed that made companies liable for injuries, so they argued that they were safer than other people: "The Employers Liability Act may for a time inure to the disadvantage of the deaf, but when it is ascertained how much more careful the vast majority of them are than the average hearing person the law can but react in their favor . . . [T]hey instinctively exercise every care when working around machinery and employers will soon learn that they are taking even less hazard in employing them than in employing those who hear."[5] This argument attempted to turn a negative perspective of employers about deaf people into a positive one. Deaf people should not be viewed as a safety hazard, this deaf newspaper article stated, because they were more careful than other people hired. Loss was now gain in this historical argument of the benefits of deaf people.

The issue regarding the safety of deaf workers was also illustrated in a 1915 *Washington Post* article about a liability lawsuit. A hearing man working in a glass factory was injured and blamed it on a deaf employee who was unable to hear. He sued the company because they had hired a deaf man, Ernst Ogle. Ogle testified in the case, and the article reported that "[v]erbal orders were never given in moving glass. He [Ogle] said signals were given by tapping upon the glass or by nods of the head. He said that probably eight languages were used by the workmen in the plant, and but few could understand one another."[6] Ogle's not hearing was a nonissue in the factory, according to him. Employees spoke multiple languages, so nonverbal means were utilized to communicate between the workers. A hearing employee wanted to blame the deaf person, but he defended himself and contradicted the claim. The article does not give the outcome of the case, so what happened is unknown, but it shows an example of deaf people defending their ability to be safe in the workplace. Not hearing was not a loss, as a means other than speech was used by the workers to communicate.

Another example of a Deaf Gain argument articulated by a hearing employer is found in an advertisement in the *Ohio Chronicle* for an electric factory that solicited deaf workers: "We have had so much success with a deaf-mute who has been in our employ a long time, and the work which we have here seems so well fitted to men with this natural limitation that we would be very glad indeed to find a place for four or five other good men."[7] Deaf employees were valued at this company, as it sought more deaf workers. Another article described how Henry Ford was "[i]nterested in the deaf and discriminates in their favor."[8] This claim was published

in a residential school newspaper, but is supported by research found in Robert M. Buchanan's book *Illusions of Equality.* Buchanan describes how Ford sought to not discriminate against deaf and other types of workers. He relates that Ford prized efficiency and hired people of all body types. Buchanan quoted Ford as saying that "[n]o particular consideration has to be given to deaf and dumb employees. . . . [T]hey do their work one hundred per cent."[9] Even so, although deaf people were accepted at the factory, and this was noted by the deaf community, only thirty-seven out of eight thousand jobs were open to deaf workers, and not many deaf people sought employment at Ford.[10]

A further example of employers seeking deaf workers is found in a *New York Times* article of 1907. It described a bottle company that preferred to hire deaf people. An excerpt explains: "The deaf-and-dumb are better workmen than the men in possession of all their faculties. . . . [A]t the present time over half of the employes [*sic*] are deaf-mutes. . . . [The employer says,] 'As the result of seven years' experience I now prefer mutes to other workmen. They are more faithful, and, when once they catch your idea, more intelligent than the normal workman. . . . I pay them higher wages than I do my other men who are doing the same kind of work. . . . If employers only knew these facts there would be fewer mutes walking the streets looking for work.' "[11] This is a striking example of the value of deaf employees to their hearing employers. In this situation, they were considered better and smarter workers, and they were preferred over hearing employees and even paid more than their counterparts. Proof that deaf workers were paid more than hearing employees would require analysis of payroll records of that company. However, it seems likely that this statement was true, as this boss was willing to announce to the other employees doing the same job (through the publication of the article) that they were being paid less than the deaf people in his employ. If he was not paying deaf people more, it seems odd that he would risk alienating hearing employees by making this statement. This employer wanted the gain that came from having deaf workers to be known; the article appeared in the *New York Times.* Deaf employees were a gain for employers; this was recognized in this case, and actively promoted. The article was reprinted ten days later in the *Deaf Mutes' Journal,* showing that deaf newspapers took notice of the argument and promoted it as well.[12] Being deaf was seen as a gain for this employer, not a loss.

Goodyear

Employers made Deaf Gain arguments about their workers in the early twentieth century, and the Goodyear factory in Akron, Ohio, was no exception. As Buchanan describes, because millions enlisted in World War I, Goodyear needed workers and in 1915 began to "actively recruit deaf men."[13] The war resulted in a shortage of employees, so this company sought deaf people. Not only did Goodyear request them, but it also made accommodations for deaf employees,

hiring interpreters and encouraging their social and athletic interests.[14] The company wanted deaf workers and adapted to them both at work and outside of the factory.

Additionally, Goodyear used Deaf Gain arguments in its discussion of these employees; deaf people were better than hearing people at certain kinds of work. Their capabilities as workers were published, and the articles were sometimes reprinted in the deaf newspapers, so that deaf people promoted this Deaf Gain as well.

One case of the promotion of deaf workers at the Goodyear factory was an article taken from the *Akron Press* and published in the *Ohio Chronicle* in 1916. It stated,

> It is commonly known at the Goodyear [*sic*] that a deaf mute applying for work will be given performance [*sic*] for certain work over men who can voice their speech. This is because the deaf mutes are so much more skillful in lines of work that require keen sight and quick observation, for which their affliction has fitted them.
>
> Besides they are numbered among the most steady men in the employ of the big rubber concern and they lose no time in needless conversation as both hands are occupied with their work.[15]

Deaf employees were considered better than their hearing counterparts in certain kinds of work in Akron, showing a Deaf Gain argument. These two paragraphs were also printed in the *Kentucky Standard* (with the word *preference* replacing *performance*).[16] Hearing people recognized what those who were deaf could contribute, and both deaf and hearing people promoted that idea. Being deaf was not a loss but a benefit at the Goodyear factory.

Goodyear advertised for deaf workers, as shown by one advertisement in the *Deaf Mutes' Journal* published in 1916. The ad said, regarding deaf people, that "[t]he Company is pleased with their work and welcomes other deaf-mutes looking for positions."[17] Goodyear wanted more deaf workers. According to one employee, at the end of 1916 there were around 140 deaf people at Goodyear, and the company wanted more.[18] A different article claimed that the labor manager at Goodyear, after being told of the numbers of deaf people in the United States, stated, "I wish I could have 'em all!"[19] These examples show that deaf people were valued at the factory. Furthermore, Goodyear made efforts to treat them like their hearing workers. It had provided a school for its hearing employees, and then a deaf counterpart was started by a deaf alumnus of Gallaudet.[20] Deaf people were given opportunities for education at Goodyear similar to those that their hearing coworkers received.

Goodyear continued to desire deaf employees during the First World War. As another article stated in 1917, "Goodyear wants more deaf men."[21] However, the

company would not hire everybody. Deaf people were warned in the *Deaf Mutes' Journal* that they needed to send in an application before they went to Akron. Some ignored this advice and were not hired when they arrived, because the positions for deaf people had been filled.[22] This reveals that there were limitations to the hiring of deaf people at Goodyear.

Goodyear also celebrated its deaf employees by recognizing them in its own publication. In 1918, Goodyear printed an issue of the *Wingfoot Clan* in honor of its deaf workers. An excerpt was published in the *Ohio Chronicle:*

> Several years ago we were urged by the United States Labor Department at Columbus to try a few mutes in our organization on factory operation. We were rather skeptical at the time as to whether this would prove successful or not, fearing accidents, but we determined to try it out. We were most agreeably surprised at the result, finding that these men made up by quickness of eye and quickness of hand what they lacked in other senses. We have found them both efficient and industrious, full of Goodyear spirit, and the more that we can get in our organization of the type represented by those who are now with us, the better off the company will be.
>
> We sincerely hope that their numbers in the Goodyear family will continue to increase. —P.W. Litchfield, Factory Manager.[23]

Not only were deaf employees seen as having benefits but they also were believed to add to the company and to improve it. Goodyear in this publication expressed its desire to hire more deaf employees because of what they contributed to the overall well-being of the company. This is a Deaf Gain argument; deaf people were recognized as having skills, and there needed to be more of them. Their work was desired because of their contributions.

This issue of the *Wingfoot Clan*, with the headline "Goodyear Gives Every Mute a Chance to Do His Bit" on the front cover, also gives insight into some of the positions in which deaf employees worked at the factory. Some deaf men were chemists, detailers, draftsmen, and payroll clerks. Deaf women who worked in the office held jobs such as stenographer and typist.[24] Deaf Goodyear employees worked in a variety of positions for the company.

Goodyear's praise of its deaf employees was beneficial. The *Silent Hoosier* remarked that "[t]he public statement by the Goodyear Tire and Rubber Co. of Akron, O., that the deaf are superior workmen, has done a lot of good."[25] On more than one occasion, deaf people were praised by Goodyear, and according to this article, that had a positive impact.

Goodyear continued to advertise for deaf workers, and the ranks of deaf employees increased. In 1918, the company reported in an advertisement that it had approximately four hundred in their employ and that there were more jobs available, as the "work is especially desirable for mutes."[26] This ad was also published

in the *Deaf Mutes' Journal*.[27] Goodyear had positions that fit the skills of its deaf workers, showing a Deaf Gain approach to its recruitment.

An additional Deaf Gain argument is found in a 1918 *Deaf Mutes' Journal* article, which noted that at Goodyear, "[b]eginners receive 35–40 cents an hour while learning, which takes one to four weeks, depending on the individual. They are then placed on piece work, where the deaf have demonstrated their superiority to hearing employees, many averaging from $40 to $50 per week without overtime."[28] It was again argued that, in certain positions in the factory, deaf workers were considered better than those who could hear.

However, not all in the deaf community agreed that deaf people were better workers. One 1918 article in the *Silent Worker* articulated doubts about the superiority of deaf people, predicting that their jobs would be at risk upon the return of the soldiers:

> When the war is over munition-making will suffer a slump, and in addition, the home-coming armies of young men hardened and weather beaten—full of fire, resourcefulness and courage,—qualities developed at the front, will come in competition with the deaf factory workers.
>
> To say that the deaf can easily hold their own, shows a bad knowledge of business management. Those who think that the opening of one factory after another to deaf workmen is due entirely to their excellence as workers and not due to the scarcity of workers in the labor market, are not well versed in the subject of labor markets. Where have deaf men ever been preferred to hearing workmen except in instances where the good deaf workmen have been in competition with poor hearing workers?[29]

Once the war was over, this article argued, deaf people would have to compete, and they were being hired only because of the lack of employees available. This article raised the question of whether Goodyear would continue to value its employees following the end of the war. When soldiers returned from overseas, if Goodyear proceeded to replace deaf people with hearing workers, its Deaf Gain arguments and recruitment of deaf employees would be devalued by showing they were hired simply because workers were needed, not because Goodyear believed there was any benefit to having deaf people in its employ.

Akron after World War I

The previous examples show that Goodyear actively sought to hire deaf people in its factories during World War I. Deaf people realized that the war had led them to be hired: "The move to accept the deaf began before the war, in manufacturing centers like Akron, Detroit, etc. The war caused a shortage in man power, and the deaf, being exempt from military service, were available as workers and were eagerly sought."[30] The decrease in available men had meant more workers

were needed. Once the war was over, if these deaf workers were dismissed because of the returning troops, it would show that the Deaf Gain arguments were meant solely to recruit deaf people and that the factories did not value their deaf employees for being deaf but simply needed employees. However, the primary sources indicate that not only were deaf people *not* ejected from employment in Akron following World War I and the return of nondeaf people to factory work, but Goodyear, and Firestone as well, *sought* deaf workers following the war. Akron companies continued to seek to increase the ranks of deaf people in their factories even though the conflict in Europe was over.

Once World War I concluded, in November 1918, men from the military did try to return to the factories. This can be seen in a *Deaf Mutes' Journal* article published in February 1919.[31] However, in spite of the returning labor source, deaf people continued to work in Akron: "More than 500 deaf persons are employed in the various departments of the Goodyear Tire and Rubber Company's factory at Akron, Ohio. Shut out from military service because of their disability, and denied employment in industrial plants in peace time because of prejudice on the part of employers, the great demand for labor on war material gave the deaf mute his opportunity, states a report from the Goodyear factory. So well did the unfortunates perform their task in helping to win the war that almost without exception they have been retained at their posts of duty."[32] The article in which this excerpt appeared, published in the *Oregon Outlook* and taken from another paper, was printed in May 1920, eighteen months following the conclusion of World War I. According to the writer, deaf people had been retained in their jobs following the war.

Some people were concerned that deaf people would be laid off. This is shown in an advertisement in January 1919 for classes to train deaf people to get civil-service jobs that indicated deaf people would be out of work.[33] However, not only were deaf people kept in their jobs but Goodyear continued to recruit deaf people. Advertisements appeared in the Little Paper Family, such as one published in the *Deaf Mutes' Journal* in May 1919 that stated, "We are offering steady employment to a large number of mutes for production work in the rubber industry."[34] Another ad appeared in December 1919 in the *Deaf Mutes' Journal*, and an advertisement in the *Missouri Record* titled "An Opportunity Awaits You" was published in March 1920.[35] The war was long over by then, but Goodyear continued to recruit and hire deaf people.

Goodyear treated its employees well, according to one person who experienced the factory. A February 1919 article by L. A. Elmer, who had stayed five months at Goodyear, published first in the *Palmetto Leaf* and later in the *Deaf Mutes' Journal*, stated that "[t]he demand for deaf men and women is still growing," indicating that deaf people would continue to be hired. Elmer also wrote that "[i]n fact, my five months' stay in Goodyear afforded me many extra opportunities for studying the relation between the deaf and the factory authorities; and I can say without

reservation that they are most excellent in every way. No partiality whatever is shown between the deaf and the hearing. Where the deaf show marked ability and application to work, they are made foremen or inspectors over deaf as well as hearing workmen."[36] Deaf people were not only hired but also, according to this, promoted at Goodyear.

Furthermore, the deaf workers at Goodyear were publicly praised. It was reported that, at a sporting event, the president of Goodyear stated during halftime, "[T]hey [deaf people] were some of the best men and women in the factory."[37] This report was published in 1919, a few months after the close of World War I, but the deaf workers at the Goodyear factory were still being praised, showing that the company valued its deaf employees.

Furthermore, in April 1920, the *Wingfoot Clan* again published an issue focused on Goodyear's deaf workers. This issue discussed multiple aspects of deaf employment at Goodyear, including athletics and educational opportunities.[38] The headline of one article was "Six Hundred Silents Find Contentment in These Goodyear Factories." More than a year after the end of the war, there were six hundred deaf employees at Goodyear.[39] This shows that deaf people were still esteemed at Goodyear in the years following the war.

The Firestone company also wanted to hire deaf employees, and it heavily recruited them following the war. One way it did this was to hire Ben Schowe in 1919 specifically to recruit deaf workers.[40] The Firestone company possibly saw the success that Goodyear was having with its deaf employees. According to a November 1919 article in the *Silent Hoosier*, Firestone hired about two hundred deaf people between March and November 1919: "Workmen who neither talk nor hear are finding the word 'Welcome' on the door mat of the Firestone Factories at Akron."[41] This was also stated in the general-circulation newspaper the *Atlanta Constitution*.[42] Firestone's heavy recruitment of deaf people following the war shows that having men leave the factories for the military did not seem to be the sole reason deaf workers were desired. Firestone advertised that it wanted "strong, energetic deaf workmen."[43] Firestone saw the benefits of hiring deaf people and wished to increase their numbers.

The mutual recruitment of deaf people would create a rivalry between the two companies: "It has taken Firestone a long time to see the light, but now that they have come over and understand that they can hire no better workmen than the deaf are, they do see the light. . . . A great rivalry has always existed between Goodyear, in not only work, but also sports, and no doubt the deaf employees of these two firms will carry on the rivalry—and may the best men win."[44] Not only were deaf people wanted in Akron, they had more than one company to choose from. According to one article, though, Goodyear would always be the best: "I wonder if there is another Industrial Company anywhere in the united [*sic*] States that considers the welfare of their workers as much as does the Goodyear Tire and Rubber Co. of Akron. I do not say this because of Goodyear's splendid treatment

of the deaf, but because of her work in looking out for each and every man she employs. . . . Goodyears [*sic*] still is and always will be the silents' one best bet."[45] Deaf people were treated well by Goodyear, so some believed it was the best company. However, some employees jumped between companies, as deaf Goodyear employees went to Firestone.[46] They had the option of which company to choose, as both Goodyear and Firestone sought deaf labor.

Furthermore, Firestone also published a newspaper praising its deaf employees, according to an *Oregon Outlook* article. This deaf newspaper discussed a publication put out by Firestone that said, "The men have proven themselves invaluable in certain phases of production, and their presence in the complex operations of the gigantic institution is now a fixed fact. . . . Quick of eye, deft of hand, nimble of mind (in such ways does the inevitable law of compensation seem to maintain a sort of balance in human life) their native attributes are usually buttressed by a special and specialized education."[47] Firestone recognized that deaf people were good employees, so it sought to hire them and also praised them.

A further example that deaf people were still valued following the war is Goodyear's beginning of a training program for its employees to aid them in getting into Gallaudet College, an institution of higher education specifically for deaf people located in Washington, D.C. In 1920, Goodyear created a "preparatory school for the deaf in connection with Goodyear institute. Its purpose is to prepare those students who are desirous of entering Gallaudet College but who haven't the opportunity to take the required course or whose financial means will not permit them to do so. . . . Dr. Percival Hall of Galludet [*sic*] College has approved our plan."[48] Goodyear not only kept deaf employees after the conclusion of the war but also desired to assist them in gaining higher education. If the company did not value its deaf employees, it seems unlikely such a program would have been put into place. An article published in the *Missouri Record* (taken from the *Deaf-Mutes' Journal*) about this education program proposed that it was not charity but good business practice: "The Goodyear Company is not posing as a philanthropic or charitable corporation. It is a keen and far-sighted business proposition. It is axiomatic that general education is the basis of general prosperity—an enlightened community is invariably a progressive community: and as the Goodyear plant is a big community in itself, it follows that the plant will reap the benefit of a consistent and progressive effort looking to a higher educated class of employees."[49] According to this deaf newspaper article, the motivation of Goodyear for this program was that education created better workers, and thus it extended the educational opportunities for its deaf employees.

However, although many deaf people were still recruited and kept at the factories following the First World War and educational programs were established for them, gender played a role in what jobs they had and whether or not they were kept. When the soldiers returned from the war, women were the ones laid off from their positions: "During [*sic*] to the great number of soldiers returning to work in

the factory a good many girls have been turned off, and the orders have been issued to hire no more. So mute girls who contemplate coming to Akron, would do well to think it over quite awhile before wasting time and money on the trip, as no places are open for them."[50] Thus it appears women were the group dismissed from the factories following the conclusion of World War I.

However, this policy did not continue, as soon women were hired back at the factories: "Goodyear has once more opened her doors to female labor and the deaf ladies over the country, who wish to come to Akron to work for Goodyear will be taken on provided they pass the required tests, and the company is now taking special pains to furnish adequate entertainment for its female helpers."[51] Thus, women were hired at Goodyear following World War I, including deaf women. Gender played a role in what jobs they assumed. Deaf women were sometimes placed in office work, an area of the factory that was excluded from deaf men: "During the last few weeks several of the Silent girls have been placed in good office positions in the Goodyear factory. Let us hope that the management will soon offer the same privilege to the boys, as there are several who are anxious to get into the office, myself expecially [*sic*]," wrote one worker.[52] Deaf women but not men could work in the offices, and this upset some men. J. Frederick Meagher, director of the National Association of the Deaf, encouraged a letter-writing campaign to stop Goodyear from keeping deaf men out of the offices.[53] Deaf men with higher education did begin to be hired to do office work, according to a 1920 issue of the *Wingfoot Clan*, and they performed so well that more were brought into office positions.[54] Thus, although gender added a layer of complexity to the work of deaf people in the factories, both deaf men and women were kept in the employ of Goodyear following the war.

Hard times did eventually come to the factories, and cuts were made, including deaf workers. Buchanan's book *Illusions of Equality* explains that layoffs happened because of a slowdown in production. In July 1920, Goodyear and Firestone laid off deaf workers (one hundred and fifty, respectively), but these layoffs did not just impact deaf employees, as "thousands of workers" were laid off from these two companies.[55] Following the war, there was less production, affecting all workers, not just those who were deaf.

Another discussion of the layoffs comes in a 1921 article in the *Deaf Mutes' Journal:* "Business remains poor in Akron. The Goodyear and Firestone factories putting on men last April are reducing the working forces again each week[,] due to the cut of the number of tire production, because there was little demand for them from the country. The Goodyear Silent colony seems to be apparently decreasing—lay offs."[56] In 1921, several years after the end of the war, deaf people lost their jobs not because of returning soldiers but because of a decrease in demand for the products they were manufacturing.

This downturn did not continue, however, and deaf people were once again hired in Akron, Ohio. According to a 1922 *Oregon Outlook* article, Goodyear at

the time was hiring "one or two deaf men a week," including people laid off previously.[57] Deaf people were still valued and given employment. In 1923, the *Silent Hoosier* noted that there were between seven hundred and one thousand deaf people working in Akron, and more were needed.[58] Long after the conclusion of World War I, deaf people were a large presence in Akron. Even in 1927, deaf people were still employed at Goodyear, as evidenced by an editorial written by a deaf person in the *New York Times*.[59] The conclusion of the war did not cause deaf people to lose their jobs in Akron's factories.

Further evidence that shows deaf people were still valued after the war is the existence of the Flying Squadron. One article published in the *Baltimore Sun* (a general-circulation paper) described how twenty-four deaf workers at the factory graduated from the Flying Squadron, a three-year intensive course in which the men had to master every job in the factory as well as attend two hours of school per week, where learning included studying rubber, math, and business. Describing this accomplishment and the deaf workers' ability to memorize all the information connected with their tasks, the article quotes an official:

> Chester Yon, foreman of the flying squadron, explains it by the silent power of concentration.
>
> "They are not distracted by the noise and rush of the factory. . . . When they are learning an operation they don't see, hear or think of anything else. And when they get an operation once they have it for keeps. It is very seldom that you have to show a silent how to do a thing a second time."[60]

Regarding this course, being deaf was viewed as a gain. Deaf people were not distracted, and it was said that they learned quickly and did not have to be shown twice. This is another example of Deaf Gain articulated by hearing people at the Goodyear factory following the end of the war. The Flying Squadron was also praised in an article in a 1921 issue of the *Oregon Outlook*, which was a reprint from the *Wingfoot Clan*, Goodyear's paper.[61] These deaf workers had mastered the various jobs in the factory and were praised for their skills.

One official from Goodyear, writing during World War II in 1945, looked back on the time after World War I and shed light on what happened regarding layoffs, particularly within the Flying Squadron. He wrote in a deaf newspaper, the *Cavalier:*

> When the depression of the 1920's struck, we had to lay off thousands of people, doing this on the basis of seniority and taking family conditions into account. The Squadron was finally cut down to about 600, including 150 silents. Another 10 per cent cut was necessary, about 50 people. I decided to call for volunteers, telling the men that some had family conditions and obligations where a lay-off would entail great hardship, where others

> undoubtedly could go back to the farm or find temporary work until the worst of the depression had passed. And almost as many volunteers came from the silents as were needed in the whole lay-off. Of course, we took them on a quota basis, and I am glad to report that in a few months the tide turned and we were able to hire them all back. I will always remember this incident as outstanding.[62]

Layoffs did happen, and according to this member of Goodyear's management, deaf people in the elite Flying Squadron volunteered to be cut. However, they were rehired once the work at the factory picked up again. These employees were valued, and their contributions to Goodyear were appreciated to the extent that even though some did lose their jobs, they were able to regain them and be employed once more at Goodyear. Employment and layoffs came based on demand in the factory, not on hearing status.

Conclusion

The current theory of Deaf Gain discusses how being deaf can be reframed as a gain rather than a loss. Examples from early twentieth-century newspapers show how this idea was argued historically, by both deaf and hearing people. Employment was one category in which Deaf Gain arguments were made. Employers argued that deaf people were more skilled in certain ways, and they hired them. Deaf people were described as learning quickly, observing well, and having good eyes and hands. Arguments were made through the medium of the press that deaf people were competent workers. These arguments are valuable, because they confer positive attributes to deaf employees at a time when deaf people were perceived to have a deficit.

The Goodyear factory in Akron, Ohio, was one of the companies that celebrated deaf people. It actively recruited deaf workers during World War I, praising their skills. Following the end of the war, deaf people retained their jobs at the factory. Goodyear continued to hire them, and Firestone hired Ben Schowe to recruit deaf workers. Gender influenced where deaf employees were placed. Layoffs did eventually happen, in the early 1920s, but they were due to a decrease in production, not a devaluing of deaf employees. Deaf people were rehired once the factory work picked up again. Deaf men also joined the elite Flying Squadron. Deaf people were valued as employees following the war, showing that their skills were recognized, and they were not dismissed once hearing soldiers returned from battle.

Deaf people contributed to the factories, and their work was recognized and praised. Deaf Gain is a new theory, but its concepts can be seen historically through newspaper discourses in the early 1900s, including in Akron, Ohio. Deaf workers flocked there to work during World War I, employers considered them to be good workers precisely because they were deaf, and they continued to be desired after the fighting concluded.

Notes

1. H-Dirksen L. Bauman and Joseph J. Murray, "Deaf Studies in the Twenty-First Century: 'Deaf Gain' and the Future of Human Diversity," in *Oxford Handbook of Deaf Studies, Language, and Deaf Education* (New York: Oxford University Press, 2010), 2:210–25.
2. "Job for Deaf-Mutes," *New York Times,* October 29, 1905, 12.
3. "Seeks Deaf-Mute Labor," *New York Times,* July 31, 1923, 17.
4. "When Silence Is Golden," *Kentucky Standard* (Danville, Ky.), January 4, 1917, 3.
5. J. P. Walker, "The Employer's Liablity [*sic*]," *Kentucky Standard,* February 17, 1916, 57.
6. "Deaf-Mute Star Witness," *Washington Post,* December 11, 1915, 6.
7. M. R. Berry, "In an Electric Factory," *Ohio Chronicle* (Columbus, Ohio), September 23, 1916, 3.
8. "Henry Ford and the Deaf," *Ohio Chronicle,* April 29, 1916, 4.
9. Robert M. Buchanan, *Illusions of Equality: Deaf Americans in School and Factory, 1850–1950* (Washington, D.C.: Gallaudet University Press, 1999), 76.
10. Ibid., 75–76.
11. "Deaf Mutes Best Workmen," *New York Times,* March 18, 1907, 1.
12. "Deaf Mutes Best Workmen," *Deaf Mutes' Journal* (New York, N.Y.), March 28, 1907, 2.
13. Buchanan, *Illusions of Equality,* 77.
14. Ibid., 78–79.
15. "Shop Operates without Word Being Spoken," *Ohio Chronicle,* January 15, 1916, 1.
16. "People We Know," *Kentucky Standard*, January 13, 1916, 15.
17. "Wanted," *Deaf Mutes' Journal,* November 2, 1916, 4.
18. "Akron, Ohio," *Deaf Mutes' Journal,* December 14, 1916, 2.
19. "Akron, O.," *Deaf Mutes' Journal,* May 24, 1917, 1.
20. A Dyed-in-Wool Goodyearite, "Akron, Ohio," *Deaf Mutes' Journal,* January 18, 1917, 3.
21. Courter, "Akron, O.," *Deaf Mutes' Journal,* November 2, 1917, 1.
22. A. D. Martin, "Notice," *Deaf Mutes' Journal,* December 20, 1917, 2.
23. "Goodyear Issues a Special Paper in Honor of Their Deaf Employes [*sic*]," *Ohio Chronicle,* May 18, 1918, 2.
24. "In the Factory and Office Silents Have Been Proficient Workers," *Wingfoot Clan* (Akron, Ohio), May 11, 1918, 5.
25. "Deaf in Field of Industry," *Silent Hoosier* (Indianapolis, Ind.), February 14, 1918, 3.
26. "Chance for Employment," *Ohio Chronicle,* May 11, 1918, 2.
27. "We Are Offering Steady and Summer Employment," *Deaf Mutes' Journal,* May 16, 1918, 4.
28. Akronite, "Akron, O.," *Deaf Mutes' Journal,* August 8, 1918, 3.
29. "The Deaf and the War," *Silent Worker* (Trenton, N. J.), July 1918, 192.
30. Edwin A. Hodgson, "Taking a Broad View . . . ," *Deaf Mutes' Journal,* May 8, 1919, 2.
31. Akronite, "Akron, O.," *Deaf Mutes' Journal,* February 13, 1919, 1.
32. "The Deaf Make Good at Tire Building," *Oregon Outlook* (Salem, Ore.), May 8, 1920, 4.
33. "The Same Old Story," *Deaf Mutes' Journal,* January 16, 1919, 4.
34. "Factory Work," *Deaf Mutes' Journal,* May 1, 1919, 4.
35. "If You Are Tired . . . ," *Deaf Mutes' Journal,* December 4, 1919, 4; "An Opportunity Awaits You," *Missouri Record* (Fulton, Mo.), March 27, 1920, 6.
36. L. A. Elmer, "Goodyear and the Deaf," *Deaf Mutes' Journal,* February 27, 1919, 4.
37. Ben Hur, "Akron, O.," *Deaf Mutes' Journal,* February 20, 1919, 3.
38. "Silent Special Edition," *Wingfoot Clan,* April 1920.
39. "Six Hundred Silents Find Contentment in These Goodyear Factories," *Wingfoot Clan,* "Silent Special Edition," April 1920, 2.
40. Buchanan, *Illusions of Equality,* 81.
41. "The Firestone 'Silents,' " *Silent Hoosier,* November 13, 1919, 1.
42. "Deaf Make Good at Tire Building," *Atlanta Constitution,* October 12, 1919, F15.
43. "Firestone," *Deaf Mutes' Journal,* May 1, 1919, 4.

44. Ben Hur, "Goodyear Clan," *Deaf Mutes' Journal,* April 3, 1919, 1.
45. T. E. Hill, "Akron, O.," *Deaf Mutes' Journal,* October 16, 1919, 2.
46. Ben Hur, "Akron, O.," *Deaf Mutes' Journal,* May 15, 1919, 1.
47. "The Deaf Congregating at Akron," *Oregon Outlook,* January 17, 1920, 4.
48. R. S. Moore (of the Goodyear Tire and Rubber Company) to the Superintendent of the State School for the Deaf, Fulton, Mo., published in the *Missouri Record,* March 13, 1920, 4.
49. "Extraordinary Proposition," *Missouri Record,* March 27, 1920, 4.
50. Hur, "Akron, O.," 3.
51. Ben Hur, "Akron, Ohio," *Deaf Mutes' Journal,* July 17, 1919, 2.
52. Hill, "Akron, O.," *Deaf Mutes' Journal,* December 4, 1919, 1.
53. J. Frederick Meagher, "Chief Heyer Is Awarded . . . ," *Deaf Mutes' Journal,* January 23, 1919, 3.
54. H.G. Funsett, "Personnel Dept. Finds Silents Efficient Workers," *Wingfoot Clan,* "Silent Special Edition," April 1920, 3.
55. Buchanan, *Illusions of Equality*, 81.
56. Akronite, "Akron, Ohio," *Deaf Mutes' Journal,* June 9, 1921, 2.
57. J. Frederick Meagher, "Successful Deaf," *Oregon Outlook,* April 15, 1922, 8.
58. "From Akron, Ohio," *Silent Hoosier,* March 22, 1923, 6.
59. Jean Wolverton, "The Independent Deaf" (editorial), *New York Times,* March 2, 1927, 24.
60. "24 Mutes Graduated," *Baltimore Sun,* August 28, 1921, MS7.
61. "The Deaf Workers at Akron," *Oregon Outlook,* December 1, 1921, 4–5.
62. Harry E. Blythe, "Goodyear Aircraft Corp. Head Relates Experiences with Deaf," *Cavalier* (Washington, D.C.), April 1945, 1, 7.

19

EFFECTIVE DEAF ACTION IN THE DEAF COMMUNITY IN URUGUAY

ELIZABETH M. LOCKWOOD

Most Deaf and Hard-of-Hearing individuals in Latin America and the Caribbean are denied access to most sectors of society, stemming from the limited availability of trained and qualified sign-language interpreters; ineffective or unenforced deaf-related programs, policies, and laws; inaccessible telecommunication services; the absence of bilingual education; inadequate employment opportunities; no official recognition of a distinct language and culture; and the widespread lack of knowledge and awareness about the situation of deaf people. As a result, Deaf and Hard-of-Hearing persons in this region are not able to enjoy basic human rights. Despite significant barriers and the critical need for global assistance for Deaf and Hard-of-Hearing persons, Latin America and the Caribbean region are by and large overlooked concerning disability issues. Furthermore, research and literature, particularly in-depth studies of Deaf communities in Latin America and the Caribbean, are highly neglected, especially in South America.

This chapter provides an important new perspective on the development of the Deaf community in Uruguay and highlights the community's effective collective-action strategies to portray an example of Deaf Gain. The Deaf community uses community cohesion to collectively work toward group goals. The positive effects of collective leadership and strong intragroup collaboration and the relationship with the community's development are topics I will address.

The findings are from my doctoral fieldwork for an in-depth case study of the Uruguayan Deaf community that I completed in Uruguay from 2008 to 2009 as an Inter-American Foundation Grassroots Development Fellow. Specifically, I analyzed the process and sustainability of collective action within the Deaf community in Montevideo and its relationship to the implementation of national deaf-focused programs, policies, and laws.

Definitions

It is important to define many of the terms used throughout this chapter. First, according to the Uruguayan Deaf community's preference, I capitalize "Deaf"

and "Hard of Hearing" to refer to a group of deaf and hard-of-hearing people who share a common sign language and culture, and I use the lowercase "deaf" and "hard of hearing" to refer to the medical condition of deafness or the larger group of individuals with hearing loss who are not connected to the Deaf community.[1]

Second, in this study "community" refers to the Deaf community, focusing not on communities of geographic place but rather on Deaf collective life in which Deaf and Hard-of-Hearing individuals share a common language, experiences, and interactions.[2] The "Uruguayan Deaf community" refers to the Deaf community in Montevideo unless otherwise indicated, given that the research focuses on this particular community. Certain hearing individuals are also considered part of the Deaf Uruguayan community, including CODAs (children of Deaf adults) and hearing parents and hearing siblings of Deaf persons. Interpreters (all of whom are hearing at this point) and hearing teachers of the Deaf are not considered part of the Deaf community in this study. This definition derives from information provided by Deaf-community leaders throughout my fieldwork.

Third, "grassroots activism," "grassroots development," "community organization," "community mobilization," and "collective action" are used interchangeably throughout this chapter; each is defined as "the process by which a group acquires collective control over the resources needed for action"[3] and the process of people voluntarily organizing to collectively work toward community improvement, more specifically making changes in systems, programs, policies, and practices related to the community's goals through bottom-up processes.[4]

Fourth, the meanings of "state" and "government" here differ slightly from their common meanings. A "state" is considered a large political structure made up of an entire organized community in a specific territory,[5] whereas "government" is defined as those authorized to administer the laws. Both the state and the government are influential in the development of the Deaf community.

Fifth, the notion of empowerment also weaves throughout this study. It is difficult to find consistent definitions of "empowerment," so I apply Katherine Jankowski's fitting description. She views empowerment "as a process through which a marginalized group alters the distribution of power between itself and the dominant culture."[6] And finally, for this study "networks" is defined as relationships between an entity (individual or group) and an individual, group, organization, or government entity.[7] In particular, "intragroup networks" are links among organizations and advocates within the Uruguayan Deaf community.

Background

Less than 1 percent of the total Uruguayan population comprises deaf and hard-of-hearing individuals, which makes them the third-largest national disability group.[8] The most recent Instituto Nacional de Estadística (National Institute of

Statistics) report, from 1996, estimates that 30,193 deaf and hard-of-hearing persons reside in Uruguay,[9] although some community members believe that the number is closer to 38,000 individuals. The precise number of sign-language users is difficult to ascertain, although the main concentration of signers resides in metropolitan areas.[10] The Deaf community estimates that throughout Uruguay, approximately 10,000 individuals use Lengua de Señas Uruguaya (Uruguayan Sign Language, or LSU), 1,500 persons belong to the Deaf community in the capital city of Montevideo, and, out of those, approximately 120 Deaf people are actively involved in the national Deaf association, Asociación de Sordos del Uruguay (Uruguayan Association of the Deaf, or ASUR).

Despite making up less than 1 percent of the national population and being one of the smaller disability groups, the Uruguayan Deaf community has effectively advocated for several deaf-focused programs, policies, and laws. Achievements include, among others, the official recognition of bilingual education (LSU and Spanish) in the primary deaf school in Montevideo, in 1993; the implementation of interpreters at two Montevideo secondary schools, in 1996 and 1999; the addition of relay operators by the Administración Nacional de Telecomunicaciones (National Telecommunications Administration, or ANTEL), in 1999; the recognition of LSU as an official language of Deaf Uruguayans and of Uruguay (after Spanish) in national legislation, in 2001;[11] the enactment of a 75 percent discount on text messages from ANCEL, ANTEL's cellular phone service, in 2005; the state provision of sign-language interpreters at the Universidad de la República (National University) and the Universidad del Trabajo del Uruguay (Technical University of Uruguay, UTU) in Montevideo, in 2007;[12] the provision of interpreters at competitions to gain employment, in 2007; the creation of the first accessible national film, in 2008; and the state-sponsored program to teach state employees LSU, in 2009.

Despite ubiquitous barriers, the Deaf community has mobilized to gain greater access into majority society and, as a result, has created more programs, policies, and laws for deaf persons than most other Latin American and Caribbean nations. Moreover, the Uruguayan Deaf community has achieved more objectives than other national disability groups. The impressive development of the Deaf community is not simply the result of effective national disability legislation but also the combination of a supportive social structure and continual Deaf-community advocacy. Uruguay contains fewer disability laws and decrees than are found in culturally, politically, and economically similar nations such as Costa Rica and Argentina, as well as in differently structured nations like the Dominican Republic and Honduras. Yet at the same time, Uruguay boasts more deaf-focused laws and decrees than any of these other countries.[13] Furthermore, deaf-related legislation and policies in Uruguay are not modeled after foreign systems but represent the first of their kind in the region.[14]

Methods

My research draws on an identity-based grassroots development and social-movement framework to provide insight into the development and sustainability of this unique community. Qualitative data were gathered over a twelve-month period through in-depth interviews with fourteen community leaders and twelve community members, extensive participant observation, and document analysis. The majority of the observations were carried out at the three main Montevideo-based Deaf organizations: ASUR, the Centro de Invesitgación y Desarrollo para la Persona Sorda (Center for Research and Development for the Deaf, or CINDE), and the Asociación de Padres y Amigos de Sordos del Uruguay (Uruguayan Association of Parents and Friends of the Deaf, or APASU). Observations also took place at the Organización Deportiva de Sordos del Uruguay (Uruguayan Sports Organization for the Deaf, or ODSU) and at various Deaf-related events throughout Montevideo.

All interviews were videotaped privately in LSU or in spoken Spanish. The fourteen Deaf-community leaders, key informants, were interviewed to provide insight about their leadership roles and direct involvement in the process and sustainability of community collective action. In addition, the subsample of twelve community members were also interviewed to complement the leaders' perspectives and to provide ground-level viewpoints. Both leader and member perspectives are highlighted throughout this chapter to illustrate the complementing standpoints. Each participant was interviewed approximately one to three times, for one to two hours each until saturation occurred.

All names of research participants were changed for their protection. Furthermore, at times even pseudonyms are removed when subject matter could indicate the identity of an interviewee. Because the Deaf community in Montevideo is quite small, names of signifying events also have been changed or eliminated to protect research participants. Almost all participants were Deaf persons who utilize LSU, but in a few cases Hard-of-Hearing, oral, and hearing people involved in the Deaf community were interviewed in spoken Spanish to provide additional perspectives. Because few Hard-of-Hearing, oral, and hearing people were interviewed, the status of deaf, hard of hearing, oral, or hearing has been left out for confidentiality. All participants were between the ages of eighteen and sixty-four. Age was well represented among participants but has been left out to protect their identity. Gender was evenly distributed between both leader and member groups and thus is indicated by the gender of the pseudonyms.

Leadership

A consistent emergent theme throughout interviews was the importance of effective leaders, and especially collective leadership action:

> The community works within as a team to obtain collective goals for work, study, or to create a proposal. I believe working as a team is better. (Francisco, member)

In the early stages of the formation of an organization, individual personalities and structural mechanisms, such as coordination of meetings, are influential.[15] Charismatic leadership is essential for mobilization, because these leaders are able to communicate powerful visions and attract members because of their personal magnetism.[16] Unlike most organizations, the Uruguayan Deaf community conveys a strong sense of collective leadership rather than the following of one or a few powerful leaders. This aligns with the concept of cooperative leadership, in which group members are empowered to work together toward common goals that will create change, transform institutions, and consequently improve their quality of life.[17] Leaders guide the community, but no particular person stands out or above other members. Almost without exception, community leaders, whether self-identified or not, and members prefer to work collaboratively to achieve group goals rather than follow one powerful leader:

> I see everyone as equal inside the Deaf community. There isn't one person who is the true leader of the community; instead we share with one another. (Gabriel, member)

As Francisco and Gabriel indicate, participants suggested that the Deaf community functions by using a system of collective leadership. Instead of following one leader's ideas, the community discusses group objectives and projects together. As a result, advocacy, inclusive communication, and the sharing of information are highly valued group characteristics.

Although outwardly no particular person leads the community, administrative leaders are elected to run special-interest groups within the community at ASUR. Groups of Deaf women, Deaf youth, and Deaf senior citizens appoint leaders. These groups mainly gather socially, but the Deaf youth commission is expanding as a politically active unit, planning recent organizational efforts such as a 2008 Deaf-community march.

The Deaf community not only practices collective leadership but also perceives the concept of individual leadership through a negative lens. Perhaps this perception arises from blurred concepts of leadership and authority, which often overlap in Uruguayan society. This interpretation parallels Max Weber's analysis of three types of authority: traditional authority, charismatic authority, and legal-rational authority. Traditional authority comprises a leader with a dominant personality, charismatic authority consists of a charismatic leader, and legal-rational authority features functional or bureaucratic officials.[18] Uruguay in the past forty years has been subjected to all three of these authority styles, as well as a military

dictatorship (1973–85) that is still quite fresh in many Uruguayan citizens' memories. Impacts from the harsh removal of the traditional democratic system are still evident today. Many Uruguayan people continue to seek justice for torture, unlawful imprisonments, and deaths that transpired under the military dictatorship's rule. Recently Gregorio Álvarez, the de facto president in Uruguay from 1981 to 1985, was sentenced to prison for twenty-five years (not common in Uruguay) for his role during the last five years of the dictatorship and his involvement in thirty-seven murders.[19] More interesting is the case of José Mujica, a former Tupamaro (Marxist urban guerilla) leader who won the national presidential election in November 2009 for the Frente Amplio Party. President Mujica is widely regarded as a national hero based on his humble background, modest lifestyle, and fourteen-year imprisonment during the dictatorship.[20]

Although the Deaf community encourages collective leadership, individual leaders still emerge. Yet none of these individual leaders is considered absolutely essential for the community's evolution, and the absence of one powerful leader does not appear to have hindered community development. This concept differs from depictions in collective-action literature in which scholars argue that movements can form without leadership but that effective movements need one or a few skilled leaders who are aware of members' changing interests to sustain the momentum.[21] My findings suggest that Deaf Uruguayans purposefully engage in collective leadership rather than follow one leader to prevent potential authority figures from gaining control of the community. This touches on Paddy Ladd's concept that Deaf communities form from a strong sense of cultural collectivism and if leadership is not rooted from the ground up, it easily transforms into authority held over others.[22] In Uruguay this concept appears to take a step further:

> Of course we don't follow one leader! Each person is his/her own leader and takes care of him/herself. There is not one leader. If there were only one leader, s/he would be commanding everyone and become corrupt, like a dictator. (Eduardo, member)

The notion that one leader holds too much power is reflected even in LSU. The LSU sign for LEADER is negatively portrayed, with one person (the thumb) holding up the entire community (the other hand). The LSU sign contrasts with the American Sign Language (ASL) sign for LEADER, in which a group of people equally (all of the fingers of one hand) leads a group or community (all of the fingers of the other hand).

A few participants, although initially hesitant, eventually discussed their leadership role in the community. Given the community's strong emphasis on community cohesion, these leaders carefully defined their roles in order not to stand out or to be perceived as more powerful than other members. This tendency perhaps

derives from a long history of hearing paternalism in Uruguay. One leader explained his notion of leadership:

> I am not a leader who is more powerful than everyone else and to whom everyone admires [*sic*]. We in the community are not passive and look up to one person, but instead we all share and learn from each other's skills. I see myself as a role model, but not as a leader who people worship. (Felipe)

As Felipe describes, the community prefers to be viewed as an empowered group rather than be subjected to pity. The notion of being a role model points to a key leadership attribute in Uruguay, one that encourages empowerment among individual members and consequently empowers the community. Another important facet of a Uruguayan Deaf leader is that the role must emerge naturally and not be forced onto the community. As a result, group acceptance is required for the emergence of a leader:

> I feel love for Deaf people and they feel love for me, but I am not a self-proclaimed leader for power; I give my opinion only. I did not make myself a leader; rather I believe I am a natural leader. (Jorge)

Regarding gender, both male and female leadership roles appear to be equally distributed. Throughout my interviews, all the women participants stated that sexism was not an issue for them in Deaf the community, unlike in the past, when Deaf women encountered myriad forms of sexism from Deaf male counterparts. Yet, despite these comments, a sense of embarrassment surfaced among some Deaf women leaders when discussing their leadership roles in the community. These participants downplayed or denied their contributions to the community, as Alejandra notes:

> I find it embarrassing to think of myself as a leader. Maybe later, in the future, I can become a true leader.

This comment is interesting, because Alejandra's embarrassment arises more from within and less from outside forces; it was a male leader who suggested I interview her because of her active leadership role in the community. The difference between female leaders who are embarrassed and those who are not is perhaps less a consequence of sexism and more a result of how these women are accepted by the Deaf community. It was the female leaders who were raised by Deaf parents with LSU who more easily accepted their leader position than those who were raised by hearing parents without LSU.

Effective leaders and their organization skills can be critical in keeping a

community cohesive and are vital in the formation of collection action.[23] Grassroots organizations usually draw leaders from ordinary members for whom decision making and accountability are valued attributes. Leaders successfully convey common principles, goals, and values of the group as well as advocate on behalf of those being implemented into the larger society.[24] Leaders, too, can import new ideas and tactics into an organization to stimulate grassroots activity.[25] Leaders in the Uruguayan Deaf community also hold important aforementioned attributes, of which the sharing and dissemination of information within the community are paramount, as this viewpoint shows:

> I am involved in CINDE and help Deaf people. Fewer Deaf people are coming to ASUR so I have been investigating their needs and have been providing information to them and this has empowered them. I explain to them and their families how we have to work every day for our rights. I also work with Deaf senior citizens and explain and provide information to them, which I really enjoy it [*sic*]. (María Laura, leader)

As María Laura indicates, the sharing of information with community members is a highly valued leadership attribute. For a community too often denied communication and information access in the majority society, the circulation of information is vital for sustained collective action. Similarly, as previously discussed, fighting for community rights is a valuable asset in a leader, especially given that the community consistently encounters barriers. This leader states his opinion on this topic:

> I am a representative of the Deaf community. I teach LSU and disseminate information about the Deaf community. As a community we work well together fighting for deaf rights and sharing information with one another. (Felipe)

Providing information to the community is often linked with one's advanced educational background, considered an integral factor in a leader.

Gerald Bateman's findings show that the development of Deaf political leadership is impeded by troubled family life, passivity from family and educational systems, communication barriers, poor quality of education, lack of Deaf-community support, and the invisibility of the Deaf community as a minority group.[26] The Uruguayan case mirrors certain findings from Bateman's study, especially regarding educational background. Although egalitarianism is promoted in the Uruguayan Deaf community, not just anyone can become a leader. An apparent barrier in becoming a community leader is a low level of education.

Unlike most nations, Uruguay traditionally has provided and continues to pro-

vide widespread free education through university level. Although the state has provided accessible education for the majority society for more than a century, Deaf Uruguayans did not benefit from this policy until 1996, when sign-language interpreters were placed at secondary schools, and 2007, when interpreters were placed at postsecondary settings. As a result, most Deaf Uruguayans aged twenty-eight years and older lack middle and high school educations and any university education. Thus, Deaf people who persevered and completed secondary and post-secondary school without interpreters possess a strong sense of pride from the continual struggle during their education. Other community members similarly tend to view these individuals with respect at succeeding against such odds. Usually, but not always, these individuals take on leadership positions. Given that education is now accessible through LSU to all deaf adolescents and young adults, leaders today are expected to be well educated and to have gained necessary skills to advocate for the community. Consequently, some leaders and members believe that individuals without a strong educational background cannot be effective leaders:

> A person can become a leader depending on his/her education level. If the person is not educated, s/he cannot be a leader because s/he won't succeed at leading people. Also, if s/he has a different way of thinking from lack of education s/he cannot be a leader. (Felipe, leader)

> Someone becomes a leader in the community when s/he decides to fight for the community to gain achievements. But also to become a leader one must study and want to make gains. (Viviana, member)

Consequently, a link exists between what the community perceives as good leadership skills and educational attainment, and this is even more pronounced among the younger generation of leaders, given that secondary and postsecondary education is now accessible to deaf students. It appears from Felipe's response that without an education, it is difficult to gain the necessary consciousness or self-empowerment found to be important in empowering others and necessary to achieve collective goals.[27] Further illustrated in both Felipe's and Viviana's viewpoints is the fact that one's sense of group consciousness and empowerment may affect one's willingness to become involved in collective action and therefore may not effectively induce community members to organize and gain objectives.[28]

Overall, the Deaf community appears content with its functioning with collective-leadership strategies, although a couple of participants differed from the majority opinion and believed instead that one strong leader was better for the unity and overall success of the group. Kevin Stanley, too, holds this notion that the absence of one or a few strong leaders decreases the solidarity of a Deaf

community.[29] These participants particularly emphasized that one neutral leader is necessary to provide an unbiased perspective when mitigating contentious group issues that inevitably arise within the community:

> The Deaf community needs one effective leader to mediate between disputes and someone who gathers information and shares it with the rest of the community. The Deaf community lacks one good leader. (Soledad, member)

The lack of one organized leader may have contributed to Uruguay's absence from the 2008 South American regional survey of the World Federation of the Deaf. Uruguay was the only Spanish-speaking South American nation excluded from the regional report.[30] The reasons for not being included in the survey were not entirely clear, but ultimately, participating in the report was not a priority for the Deaf community.

As with the majority of collective-action studies, the Uruguayan Deaf community follows leaders who advocate for the community as a whole, encourage empowerment, and ignite members to fight for collective objectives. The most important attributes of active leaders in the community include motivation to fight for the Deaf cause, the fluid sharing and dissemination of information, the ability to maintain a neutral perspective among members, group acceptance, and advanced educational background. Yet, in a distinct departure from most community-development studies, the Deaf community prefers to work collaboratively to gain objectives rather than follow one leader, given that many community members conceptualize leadership through a negative lens. Like potent leadership skills, collective identity and cohesion are considered integral factors for effective organization among identity-based grassroots and social movements.

Community Cohesion

Like other communities, a well-established Deaf community is structured on unity and collective advocacy, but it is distinct in that it highlights the fundamental importance of sign language and Deaf culture.[31] Likewise, Deaf-community cohesion is pertinent to the development of Latin American and Caribbean Deaf communities. Establishing collective unity between all Deaf organizations within a nation is a current priority for South American Deaf communities.[32] Given that little research exists on leadership and group unity and their relationship to Deaf collective activism, the case of the Uruguayan Deaf community provides a valuable new perspective.

Historically, the formation of deaf schools impacted the development and cohesiveness of Deaf communities and their identities[33] and was the mechanism through which Deaf movements thrived.[34] The history of Deaf schools in the Americas began in 1817 with the formation of the first deaf school in Hartford,

Connecticut. This school became a home for many deaf children, who fostered a collective identity and thus formed a unified community.[35] Much later, in the 1970s and early 1980s, a Deaf community emerged in Nicaragua, primarily from the inception of deaf vocational schools (in 1981), where for the first time Deaf adolescents were able to spend extended time with Deaf peers and receive longer educational instruction. This encouraged independence and enabled Deaf people to establish a collective identity. At the same time, Deaf persons regularly met outside of school, which fostered a sense of community and belonging.[36]

In Uruguay, by contrast, the first and main deaf school, located in Montevideo, was residential only from 1920 until 1947. The school primarily catered to deaf children from Montevideo, and only in 1940 did the first deaf students from the interior attend. Seven years later, the government changed the boarding policy for financial reasons, and subsequently deaf students from the interior were forced either to commute long distances or to rent rooms (paid by the state) at homes near the school. In most other foreign Deaf communities, social formation emerged in the absence of hearing adults, most often in school dormitories. Distinctly, the Uruguayan Deaf community provided residential-living accommodations for fewer than thirty years. As a result, ASUR was primarily where community unity emerged, rather than the deaf residential school. For this reason, ASUR is considered the most important place for the Deaf community and where the community continues to unite. (I will discuss this later in this chapter.) Although the deaf school was not residential, some unity and cohesion emerged there, primarily from shared sign-language use on the playground and shared oppression from audist deaf educators. Deaf identity and unity still form at the modern deaf school, but only in the afternoon LSU program, as this study participant indicates:

> Aside from ASUR, Deaf identity and cohesion also form at the deaf school, at CINDE, and at Liceos 32 and 35. But it is important to point out that identity is not formed in the oral program in the mornings at the primary deaf school and that these students are not connected with the community. (Jorge, leader)

This leader's statement reflects the strong importance of sign language and full communication access when defining identity and cohesion in the community. He also acknowledges that identity forms at other learning institutions as well, including two secondary schools (Liceo 32 and Liceo 35) and postsecondary school settings (CINDE).

The emergence of a Deaf identity at the *liceos* began to develop in 1996 with the state provision of LSU interpreters in public school classes. Since then, community cohesion among younger Deaf persons has slightly shifted from its primary occurrence at ASUR to its formation at the two secondary schools. This transition provokes mixed responses, as this community leader discusses:

> Liceo 32 is growing and as a result Liceo 35, IAVA, is growing too. Now there are two Deaf teachers working at these schools. Today there is a feeling of Deaf identity at the schools, which wasn't present before, but this is still a young process. Even though Deaf kids today are learning LSU in public schools, the LSU is different at ASUR and the true Deaf identity is formed there. At public schools Deaf students see sign language and spoken Spanish as being the same, but at ASUR they feel truly comfortable, find identity, and are content with being Deaf. (Mabel)

There appears to be no Deaf identity forming yet at the National University or the Technical University of Uruguay, but fully accessible postsecondary education began only a few years ago. In 2009, around a dozen deaf students attended university programs located at different colleges dispersed throughout Montevideo, and this number was expected to increase each school year. Thus, it is likely that community cohesion will also emerge at the university in the future, when more deaf students attend programs and can easily gather and form ties.

Collective leadership, a strong collective identity, and shared experiences at shared locations, such as schools and associations, all contribute to community cohesion in the Uruguayan Deaf community. The deaf primary school, ASUR, CINDE, and more recently, secondary deaf educational settings foster a more cohesive community. By and large, ASUR is viewed as the heart of the community, and the community remains connected and united to fight to gain full access into the majority society to improve quality of life. Access to LSU and open channels of communication within the community as well as in society are also considered important attributes in creating a cohesive community. Increased access to communication and LSU also indicate the extensive formation of networks within and outside of the Deaf community, effectively assisting the community in its development.

Networks

Networks are considered key factors in gaining resources and self-representation in grassroots and social movements.[37] Sidney Tarrow argues that for a movement to sustain itself, it must comprise dense networks, connective structures, and a unified identity.[38] Networks are valuable because they can create a space for negotiation between state and nonstate actors, and from this comes the possibility of change.[39] Networks focused on advocacy can consist of research and advocacy groups, local social movements, foundations, the media, churches, unions, intergovernmental organizations, and parts of local governments. As these diverse groups communicate, share information and services, circulate personnel, and exchange funds, they work together to influence policy.[40]

Networks most commonly form to address human rights violations against vulnerable populations and function by providing information, framing impor-

tant topics, leveraging politics, and holding politicians accountable.[41] Studies indicate that grassroots organizations recognize the value in creating networks with supporters from wider circles. Inadequate attempts to build alliances and networks are found to be common barriers to group sustainability.[42] Thus, the link between building, accessing, and utilizing networks among movements and gaining achievements is important to investigate. More specifically, intragroup, transcommunity, and transnational networks are increasingly important factors in grassroots activism and social movements.[43] Despite the growing popularity of networks and their effects on movements, this subject is greatly understudied. Even less prevalent are studies on the effects of intragroup, transcommunity, and transnational networks and their relationship to Deaf activism. For this chapter, I will discuss only intragroup networks within the Uruguayan Deaf community.

Intragroup Networks

> I believe the community has gained achievements from frequent contact with one another, access and sharing of information, collaboration, agreement, and working together toward goals. The Deaf community also has always worked as a team, with both Deaf and hearing persons. (Teresa, leader)

Key intragroup dynamics include organization and motivation by leaders, collaboration, cohesiveness, communication, and collective identity, which can assist in the emergence, efficacy, and sustainability of community activism and therefore can increase community development.[44] With the absence of strong intragroup networks, a community is more likely to fracture and consequently lose power and control to paternalistic organizations.[45] Therefore, the challenge lies in the ability to sustain these networks.

More often than not, Deaf communities organize by establishing strong intragroup networks between Deaf organizations centering on local, regional, and national issues; artistic and leisure groups; sports and minority interests; and Deaf clubs and residential schools.[46] An example of effective Deaf intragroup linkages surfaced during the 1988 Deaf President Now protest, when students, faculty, and community members banded together to successfully push for the enactment of Gallaudet University's first Deaf president.[47] Conversely, when the Deaf community began to embrace a cultural and linguistic minority identity, intragroup networks weakened, with organizations shifting toward inward interests rather than majority needs.[48]

Despite the absence of literature on intragroup networks and Deaf communities in Latin America and the Caribbean, the topic appears to be gaining attention in the region. One example is a compelling presentation on the process of strengthening Deaf-community cohesion by José Antonio Leal, a Deaf Colombian leader, at the 2009 VI Encuentro Latinoamericano de Sordos conference

in Bogotá, Colombia. In his presentation, Leal encouraged Latin American and Caribbean Deaf communities to actively foster intragroup networks in order to function as a collective unit, a move necessary, he argued, to successfully obtain group objectives.

Following from Leal's assertion, I claim that the Uruguayan Deaf community practices strong intragroup networks, a key element in its development. Strong collaboration within the community among Deaf and hearing leaders (defined as hearing family members of Deaf persons: CODAs, parents, and siblings) and among different Deaf organizations and groups contributes to the creation of effective proposals, advocacy, and ultimately the approval of deaf-focused projects, policies, and laws. In my study, internal collaboration was evident through observation but also widely acknowledged and accepted by the community itself. Community leaders and members both attributed the community's significant development to strong working relationships within the community across groups, as expressed by these participants:

> One of the reasons that the Deaf community has been so successful is because ASUR, CINDE, and APASU have worked together to get rights passed and the government has respected that. (Jorge, leader)

> The community has gained rights from groups inside the Deaf community which work well together and has been fighting to obtain rights for many years. (Francisco, member)

Examples of outcomes from intragroup cooperation include the approval of national telecommunication access through ANTEL, the addition of closed-captioning services on certain local and national television programs, the creation and subsequent publication of the LSU–Spanish dictionary, and the implementation of sign-language interpreters at public secondary and postsecondary schools in Montevideo.

Deaf-community marches are also collaboratively organized. In 2006, community leaders and members from ASUR, CINDE, and APASU collectively organized the community's premier public protest. These team efforts were repeated in 2007 and 2008. The front banner of the 2008 march exemplifies the interconnected spirit in that all three associations were exhibited side by side. The names were strategically placed to equally acknowledge all three associations and to convey a united Deaf community. This action created a more inclusive atmosphere rather than giving priority to one group.

Two months after the 2008 march, Deaf and hearing allies within the community collaborated to organize the first national Deaf-community conference in November, titled Primer Encuentro de la Comunidad Sorda: Construyendo Vínculos en la Sociedad (The First Deaf Community Conference: Creating Links within

Society). The conference title and objectives reflect the community and its efforts to further advocate for connections with the majority society. Occasionally, such as in the planning of the conference, even deaf persons not actively involved in the community collaborate in Deaf-community development and projects, benefiting both parties.

Intragroup collaboration is also evident between ODSU and ASUR, which both provide athletic activities to Deaf and Hard-of-Hearing Uruguayans. Competition between the two groups is minimized, because ODSU focuses on major national and regional athletic activities and ASUR centers on cultural and social activities with the option of participation in smaller athletic activities. Community members prefer having a choice in their athletic activities, and most frequent both locations.

Rather than compete against one another for a small pool of resources, each Deaf organization recognizes and uses its area of strength to gain a wider range of resources. This cogent process allows space for the community to more easily complete and follow through with proposals and projects:

> APASU has really been important in the process of working to gain rights. ASUR and CINDE also have assisted by training and employing Deaf LSU professors who go to different departments to teach Deaf and hearing people, connecting them more to Montevideo. In my opinion, CINDE is very active in starting projects, but hits barriers and APASU finds solutions to carry them out. (Gabriel, member)

As Gabriel indicates, no particular group is considered more effective than any other in gaining access, thus providing a positive and empowering environment.

Perhaps intragroup connections are fostered and sustained more easily because of Montevideo's small geographic size and the resultant close proximity of different organizations. Also adding to the close ties within the community is the fact that most Deaf groups first formed within ASUR. Many Deaf organizations at one time were (and some still remain) housed at ASUR, including the two influential organizations CINDE and APASU, creating a fluid, accessible, and cohesive working environment. APASU gathered within the walls of ASUR until moving to its own building on the other side of the city in 2008. CINDE, too, began organizing within ASUR in the late 1980s and later moved across from the deaf school. But in 2001, CINDE returned to ASUR and henceforth has rented classroom space inside. Close proximity between the organizations creates a space for frequent information exchange and easy collaboration among leaders, members, allies, instructors, interpreters, and students. Overlapping contact also provides hearing LSU and interpreter students with invaluable exposure to the Deaf community and ample opportunities to practice their signing skills.

One of the positive outcomes from frequent interaction between organizations

is that Deaf and hearing allies cooperate to advocate for common goals. Hearing parents of deaf children, CODAs, siblings, and also some hearing teachers at the deaf primary school have provided assistance in realizing deaf-related projects, policies, and laws. These valuable allies also provide additional resources to the community. Deaf and hearing persons from CINDE join forces, recognizing and utilizing distinct roles and areas of skill. Classes are often team-taught, creating a positive atmosphere. Deaf and hearing allies also join together to develop LSU outreach programs aimed at Deaf and hearing individuals residing in the interior to increase the interconnectedness of the entire Deaf community in Uruguay.

The Uruguayan Deaf community supports Paddy Ladd's argument that Deaf communities must collaborate with hearing allies to successfully gain rights,[49] as expressed by this community member:

> The Deaf in Uruguay need to work with hearing allies and without this collaboration they won't gain achievements. An example of when collaboration works is when APASU works with the Deaf community and speaks out in support in certain situations for the benefit of the community. (Sebastián)

Naturally, good collaboration takes place among Deaf and hearing allies as long as respect for equality is present between the groups. If Deaf people feel discriminated against or devalued by hearing persons in the community, tension invariably emerges between parties. To prevent such roadblocks and express equality, open and frequent channels of communication between Deaf and hearing individuals are encouraged. The following leader and community member describe the conflict that can arise between Deaf and hearing individuals:

> Yes, we work with hearing people and we need to work with hearing people, but they need to realize they are not better than us and that we are equal. The problem sometimes is that hearing people think they are better than Deaf people and it doesn't sit well with us. We want hearing people to talk with us and share with us, but not tell us what to do. (Mabel, leader)

> There are many people who work for rights. Sometimes we get collective goals. It is very important to share opinions, but sometimes that does not happen between Deaf and hearing people. What the Deaf don't want is to see a hearing person go ahead of a Deaf person to feel superior. They want equality. (Francisco, member)

Along with equality between Deaf and hearing persons, Deaf members expressed the desire to improve the integration of interpreters into the community in order

to increase unity within the community. A lingering issue is that the government does not yet officially recognize the national interpreter association, and so ethics, regulations, and organization are inconsistently and irregularly enforced. Deaf persons desire more interpreter involvement at ASUR to increase Deaf members' connections with the majority society and information. This would encourage interpreters to become more integrated into the community instead of pushing aside Deaf individuals, which often currently happens. The lack of integration produces frustration for many community members. Interviewees indicated that, for the most part, interpreters disconnect from engaging with the community upon graduation from CINDE. Initially, these students express enthusiasm about working with the Deaf community, but after five intense years of interpreter training, their focus shifts to finding employment and earning money. A community member describes this process:

> I know all the interpreters and none want to help the community, they only want to work to earn money. When they first arrive and learn LSU they are so excited and say they will help the community in the future, but after five years they lose enthusiasm and only think about work and earning money. After they graduate, they leave and never come back or are involved in the community. They do their job, but without heart. The interpreters here lack professionalism, goof off, don't take things seriously, and don't represent us professionally. (Eduardo)

Despite frustrations such as those Eduardo mentions, interpreters are more organized and integrated better into the Uruguayan community than they are in other South American Deaf communities. In Argentina, for example, there is a dearth of qualified interpreters and, as a result, most services are inaccessible to Deaf persons. Although Brazil boasts the highest number of interpreters in South America, most possess a low quality of interpreting skills. Most interpreters are well trained in Colombia, but they are widely available only in Bogotá, and there is growing tension between Deaf persons and religious interpreters. No general consensus is present between interpreters and Deaf organizations in Venezuela, resulting in widespread violations of norms and ethics. The most severe situations are in Bolivia and Chile, where no formal sign-language-interpreting services exist.[50]

Intragroup alliances encourage regular exchanges of information as well as natural ties among leaders, members, allies, instructors, interpreters, and students. Increased communication and information access through media, technology, and interpreting services are strongly linked to intragroup networking. Deaf-community-centered conferences and marches, too, have emerged from community cooperation. An integral aspect of intragroup solidarity within the Uruguayan Deaf community stems from continual and well-established Deaf and

hearing alliances, as long as respect for equality is present between the groups. Building on strong networks within the community, Deaf Uruguayans are able to effectively form alliances with nondisabled hearing allies not directly connected to the Deaf community, which leads to increased societal access and deaf-related objectives.

Concluding Thoughts

The findings from my study indicate that the Uruguayan Deaf community exhibits characteristics that have positively assisted the community in its development. More specifically, collective leadership, community cohesion, and strong intragroup networks contribute to an increased access to society and to the policies, laws, and programs being implemented.

The Deaf community promotes and accepts leaders who advocate for the broader community and who also empower and encourage members to actively and continually fight for collective objectives. Unlike communities in the majority of collective-action studies, the Deaf Uruguayan community prefers to cooperate as a united group to gain objectives rather than follow one leader. Collective leadership occurs because many community members conceptualize leadership through a negative lens; they view one or a few powerful leaders as authoritative figures who are not beneficial for the overall community's development.

It is largely from collective-leadership traits and a strong collective identity that the Deaf community tightly unites and remains cohesive through time. This continual cohesion empowers and motivates community members to actively work toward gaining group objectives.

Aligned with collective leadership and community cohesion, intragroup collaboration is an excellent tool for community development in the Deaf community. Intragroup collaboration appears to aid the success of the Deaf community in gaining resources, creating self-representation, and disseminating Deaf awareness to the majority society.

The implementation of collective leadership, community cohesion, and intragroup networks within the Uruguayan Deaf community can provide an effective model for other social movements, including other Deaf communities, to assist in their struggle to gain human rights. The findings from the Uruguayan Deaf-community case study exhibit an interesting new form of collective action for Deaf communities and exemplify how this form of activism can positively impact the development of a community and society as a whole.

Notes

1. Carol Padden and Tom Humphries, *Deaf in America: Voices from a Culture* (Cambridge, Mass.: Harvard University Press, 1988).
2. Paddy Ladd, *Understanding Deaf Culture: In Search of Deafhood* (Clevedon, UK: Multilingual Matters, 2003).
3. Charles Tilly, *From Mobilization to Revolution* (Reading, Mass.: Addison-Wesley, 1978), 7.

4. Mary Lai, "Responding to Asian Pacific Islander Youth Violence: Lessons Learned from a Community Mobilization Strategy," *Crime and Delinquency* 51, no. 2 (2005): 158–79.
5. Max Weber, "Bureaucracy," in *Economy and Society: An Outline of Interpretive Sociology,* ed. Guenther Roth and Claus Wittich (New York: Bedminster Press, 1968), 2:956–1005.
6. Katherine Jankowski, *Deaf Empowerment: Emergence, Struggle, and Rhetoric* (Washington D.C.: Gallaudet University Press, 1997), 6.
7. Mustafa Emibayer and Jeff Goodwin, "Network Analysis, Culture, and the Problem of Agency," *American Journal of Sociology* 99, no. 6 (1994): 1411–54.
8. Carlos Calvo, "Demanda y Uso de Banco de Datos sobre Discapacidad" (2DA Reunion Sobre Estadísticas de Discapacidad en el Cono Sur, Inter-American Development Bank, 2003).
9. "La Lengua de Señas Uruguaya Es Casi Oficial," *El Observador* (Montevideo, Uruguay), May 20, 2001.
10. Administración Nacional de Educación Pública and Consejo Directivo Central, "Documentos de la Comisión de Políticas Lingüísticas en la Educación Pública," Montevideo, Uruguay, 2008.
11. Reconocese a Todos Los Efectos a La Lengua de Señas Uruguaya como La Lengua Natural de Las Personas Sordas y de Sus Comunidades en Todo El Territorio de la República (2001), Law no. 17.378, accessed September 27, 2008, http://www.parlamento.gub.uy/.
12. "Cursos en UTU para Sordos," *Sociedad Uruguay* (Montevideo, Uruguay), March 4, 2008; María Eugenia Lima and M. Gallardo, "Los Sordos Podrán Ir a la Universidad en Este 2007 Educación, La Udelar Financiará Intérpreters por 10 Años" (2007), accessed June 28, 2008, http://www.sordos.com.uy/.
13. Hilde Haualand and Colin Allen, "Deaf People and Human Rights" (report, World Federation of the Deaf and Swedish National Association of the Deaf, 2009); Pamela Dudzik, Ann Elwan, and Robert Metts, "Disability Policies, Statistics, and Strategies in Latin America and the Caribbean: A Review," Inter-American Development Bank (2007).
14. Dimitris Michailakis, "Government Action on Disability Policy: A Global Policy" (1997), Independent Living Institute, accessed September 18, 2007, http://www.independentliving.org/.
15. Susan Allen et al., "The Organizational Transformation of Advocacy: Growth and Development of AIDS Community-Based Organizations," *AIDS and Public Policy Journal* 10 (1995): 48–59.
16. Aldon Morris, "Reflections on Social Movement Theory: Criticisms and Proposals," *Contemporary Sociology* 29, no. 2 (2000): 445–54.
17. Dolores Bernal, "Grassroots Leadership Reconceptualized: Chicana Oral Histories and the 1968 East Los Angeles School Blowouts," *Frontiers: A Journal of Women's Studies* 19, no. 2 (1998): 113–42.
18. Max Weber, "The Three Types of Legitimate Rule," *Berkeley Publications in Society and Institutions* 4, no. 1 (1958): 1–11.
19. "Future and Past," *Economist*, October 2009.
20. "The Mystery behind Mujica's Mask," *Economist*, October 2009.
21. Jerome Schein, *At Home among Strangers* (Washington, D.C.: Gallaudet University Press, 1989); Sidney Tarrow, *Power in Movement: Social Movements and Contentious Politics* (Cambridge: Cambridge University Press, 1998).
22. Ladd, *Understanding Deaf Culture.*
23. Gerald Bateman, "Attitudes of the Deaf Community toward Political Activism," in *Cultural and Language Diversity and the Deaf Experience,* ed. Ila Parasnis (Cambridge: Cambridge University Press, 1996), 146–59; Kevin Stanley, "Partnership in the Irish Deaf Community," in *The Deaf Way II Reader: Perspectives from the Second International Conference on Deaf Culture, 2006,* ed. Harvey Goodstein (Washington, D.C.: Gallaudet University Press, 2006), 38–41.

24. Michele A. Wittig, "An Introduction to Social Psychological Perspectives on Grassroots Organizing," *Journal of Social Issues* 52, no. 1 (1996): 3–14.
25. Kim Voss and Rachel E. Sherman, "Breaking the Iron Law of Oligarchy: Union Revitalization in the American Labor Movement," *American Journal of Sociology* 106 (2000): 203–49.
26. Bateman, "Attitudes of the Deaf Community toward Political Activism."
27. Paulo Freire, *Pedagogy of the Oppressed,* 20th-anniversary ed. (New York: Continuum, 1993).
28. Wittig, "An Introduction to Social Psychological Perspectives on Grassroots Organizing."
29. Stanley, "Partnership in the Irish Deaf Community."
30. Haualand and C. Allen, "Deaf People and Human Rights."
31. Stanley, "Partnership in the Irish Deaf Community."
32. Haualand and C. Allen, "Deaf People and Human Rights."
33. Robert Buchanan, *Illusions of Equality: Deaf Americans in School and Factory, 1850–1950* (Washington, D.C.: Gallaudet University Press, 1999); Harlan Lane, Robert Hoffmeister, and Benjamin Bahan, *A Journey into the Deaf-World* (San Diego: DawnSignPress, 1996); Leila Monaghan et al., eds., *Many Ways to Be Deaf: International Variation in Deaf Communities* (Washington, D.C.: Gallaudet University Press, 2003); Carol Padden and Tom Humphries, *Inside Deaf Culture* (Cambridge, Mass.: Harvard University Press, 2005).
34. Jankowski, *Deaf Empowerment*.
35. Harry Lang, *Edmund Booth: Deaf Pioneer* (Washington, D.C.: Gallaudet University Press, 2004).
36. Laura Polich, *The Emergence of the Deaf Community in Nicaragua* (Washington, D.C.: Gallaudet University Press, 2005).
37. Stanley, "Partnership in the Irish Deaf Community."
38. Tarrow, *Power in Movement.*
39. Margaret E. Keck and Kathryn Sikkink, *Activists beyond Borders: Advocacy Networks in International Politics* (Ithaca, N.Y.: Cornell University Press, 1998).
40. Ibid.; Anita Lacey, "Networked Communities: Social Centers and Activist Spaces in Contemporary Britain," *Space and Culture* 8, no. 3 (2005): 286–301; Marc Pilisuk, JoAnn McAllister, and Jack Rothman, "Coming Together for Action: The Challenge of Contemporary Grassroots Community Organizing," *Journal of Social Issues* 52, no. 1 (1996): 15–37.
41. Keck and Sikkink, *Activists beyond Borders.*
42. Krishno Dey and David Westendorff, "Getting Down to Ground Level: A Community Perspective on Social Development," *Development in Practice* 6, no. 3 (1996): 265–69.
43. Jan-Kåre Breivik, *Deaf Identities in the Making: Local Lives, Transnational Connections* (Washington, D.C.: Gallaudet University Press, 2005); Riva Kastoryano, "The Reach of Transnationalism" (2008), Social Science Research Council, accessed October 25, 2008, http://www.ssrc.org/; Deborah Yashar, "Resistance and Identity Politics in an Age of Globalization," *Annals of the American Academy of Political and Social Science* 610 (2007): 160–81.
44. B. Ann Bettencourt, George Dillmann, and Neil Wollman, "The Intragroup Dynamics of Maintaining a Successful Grassroots Organization: A Case Study," *Journal of Social Issues* 52, no. 1 (1996): 169–86.
45. Stanley, "Partnership in the Irish Deaf Community."
46. Ladd, *Understanding Deaf Culture.*
47. Sharon Barnartt and Richard Scotch, *Disability Protests: Contentious Politics, 1970–1999* (Washington, D.C.: Gallaudet University Press, 2001).
48. Jankowski, *Deaf Empowerment;* Schein, *At Home among Strangers.*
49. Paddy Ladd, "Human Rights through Sign Language" (presentation at the 15th World Congress of the World Federation of the Deaf, Madrid, Spain, July 16–22, 2007).
50. Haualand and C. Allen, "Deaf People and Human Rights."

20

DEAF GAINS IN BRAZIL

Linguistic Policies and Network Establishment

RONICE MÜLLER DE QUADROS, KARIN STROBEL,
AND MARA LÚCIA MASUTTI

This chapter aims to present several effective gains that Deaf people have achieved in Brazil following the approval of Decree 5626 in December 2005, which regulates the Brazilian Sign Language Federal Law (Libras Law 10.436 of April 2002). It will also set out the experiences and challenges confronted by the Universidade Federal de Santa Catarina (UFSC) and the Instituto Federal de Santa Catarina (IFSC) regarding the support given by these legal documents. These institutions encourage Deaf empowerment and all other cultural forms of expression by the Deaf community, and promote the deconstruction of logophonocentric paradigms.[1] The results of these actions are the Deaf gains that show how Deaf people organize their social relations in order to develop knowledge. The main Deaf Gain discussed here is the empowerment of the network that established a Deaf organization in order to exchange experiences and knowledge through the conditions created by these institutions. There are several related Deaf gains that we will discuss as well, such as multilingual awareness throughout Brazil, the influence on translation studies, the visibility of cultural differences, linguistic and cultural negotiations among Deaf and hearing people and in Deaf–Deaf meetings in the e-learning system, Deaf access to academic knowledge, and Deaf people as enhancers of Deaf education.

Linguistic Policies as a Deaf Gain

The Libras Federal Law 10.436 (from April 2002) was a critical milestone in Brazilian Sign Language linguistic policies. This law recognizes and affirms Libras as one of the Brazilian languages used by a specific community in Brazil. This law is a milestone because it is a concrete result of Deaf-social-movement demands that are directly connected to academic research conducted on Libras.[2]

National Decree 5626 (2005) establishes guidelines on the implementation of Law 10.436 (2002) relating to Brazilian Sign Language (the earlier law is referred to as the Libras Law). Some of these guidelines are (a) the obligatory offer

of Brazilian Sign Language classes in general undergraduate teaching programs; (b) the opening of regular programs for the education of Brazilian Sign Language teaching, bilingual education for nursery and elementary schools, Portuguese-as-a-second-language education, and Sign Language Interpreter training; (c) the priority of Deaf people for vacancies in Libras teacher-training programs; (d) Deaf people's access to bilingual education (Libras as an instructional language and Portuguese as a second language); and (e) Deaf people's access to public spaces through Libras.

The consequences of the implementation of this law are that Deaf as well as hearing Brazilians have started taking advantage of this visually organized language that is Libras. Sign language is becoming more and more common among Brazilians.[3] The main Deaf Gain here is breaking the monolingual status constructed by linguistic policies over the years. The law reviews this perspective in turn, showing that Brazilians are not monolingual but rather multilingual throughout the country. The Libras Law has empowered the discussion on bilingual education in Brazil for Deaf people as well as for other bilingual language pairs. Never before have Brazilians had a law that recognizes a language other than Brazilian Portuguese. Even the indigenous population, which has bilingual schools, does not have a law recognizing their languages. This has had a huge impact on the way the country has started to consider the languages that are signed and spoken in its territory. In this sense, the mandatory Libras classes for all courses that train teachers of every area have made students realize that Libras is a language and that there are Brazilian cultures and languages besides Portuguese in the country. Teachers thus increase their knowledge, graduate, and start their careers with these new concepts. As teachers, they are then able to disseminate their multilingual perspective and the recognition of Deaf rights.

According to Louis Jean Calvet, linguistic policies are decisions about relations between languages and society strictly connected to language planning, including the implementation and application of these decisions.[4] However, there is no language planning without judicial support. Therefore, it is necessary to emphasize that Libras, with its own law, represents an important advance in the organization of new linguistic policies involving Deaf communities. It is also important to highlight that, despite the fragile aspects presented by legal documents relating to its propositions, the Libras official settlement has a direct effect on the linguistic status of Libras and, as a consequence, on its power correlation with other languages.

Decree 5626 enshrines concrete actions to transform the social exclusion of the Brazilian Deaf community, not only in formal education but also in its relation with work. Although this decree cannot be described as a legal no-fail and no-gaps instrument, it may be considered a reference tool for the recognition of Deaf communities' needs.

A policy for the use of sign language is visible at universities, schools, and in public spaces. Despite this, it is not a stress-free construction process. Unfortu-

nately, legal comments do not guarantee that Deaf–Deaf meetings to promote effective education will happen. The perspectives of the main discourse that focus on the logophonocentrism of Portuguese as an inclusive tool are still given considerable emphasis in Brazil. The crucial question H-Dirksen Bauman raises in his article "What Frames of Reference Have We Used to See Deafness in Deaf People?" remains current, as the boundary oscillates in terms of projects for Deaf citizens.[5] This boundary does not always favor deaf people and sign language.

It is not possible to naively believe that progress may happen without tension from contact with frontier zones.[6] Still, the Libras Law has empowered the multilingual perspectives that are being brought to Brazil with globalization. This represents a true Deaf Gain for Brazilian people: to be recognized as multilingual and to improve education with this perspective.

Obligatory Libras in Higher Education

What effective gains do we have given the inclusion of Brazilian Sign Language (Libras) in higher education? The main gain of this law is that Libras is now being disseminated throughout the country among the Deaf as well as among hearing people. Hearing people are gaining the opportunity to discover this language. This is also a substantial gain, because there are not yet sufficient numbers of professionals who can lecture on Libras in the various university programs. Universities are obliged to resolve this situation by offering more higher-education courses in Libras because of the high demand created by the law.

Another important aspect of the law is that, with Federal Decree 5626, many Brazilian public universities have opened positions for new professors, for which Deaf people are applying and being taken on as Libras teachers. Moreover, these are full-time, tenure-track positions that guarantee time for research as well. This active presence of Deaf professionals gives new perspectives to the interactive processes between Deaf and hearing subjects and begins the process of reviewing ways of accessing knowledge. As a consequence, hearing students have contact with Deaf people, get to know Deaf ways, and have opportunities to see the world through their language.

The fact is that Deaf participation in higher education and in training future educators has stimulated understanding of the linguistic and cultural differences of Deaf communities, as well as of the development of sociovisual skills. The former "dying away" of the Deaf was caused by many factors, the greatest of which was the absence of promotion and recognition of members of this community by a considerable percentage of the country's six million Brazilians. This community was neglected for a long time by public policy in the country. However, the picture has changed radically over the last decade, because many people have started to notice the existence of the Deaf community as a consequence of the legal stipulation.

In this context, Brazilian Sign Language (Libras) has now started to figure as

a language in the academic environment, making Deaf people more visible. With this in mind, it is interesting to consider how deaf citizens' lives are affected as a result of this academic visibility. What occurs is that the linguistic policy starts to gradually create social and cultural networks. This social connection then moves on from its own static signification in relation to language conceptions. Deaf people in contact with each other throughout the country have started to question how it is possible to enable the Brazilian Sign Language–learning process; in other words, they are questioning linguistic-planning mechanisms, which will start to "give birth" to a multilingual and multimodal society.

Linguistic-planning mechanisms point out relations of power. As Michel Foucault asserts, power exists at different levels of society and delineates a social network of micropowers.[7] For instance, the coexistence of Libras and Portuguese in some spaces can mean that hearing people feel excluded when sign language is used instead of Portuguese, and vice versa. These contexts lead to feelings of exclusion that are related to these micropowers. Hearing people feel that Portuguese should be used, and Deaf people feel that sign language should be used. When this does not happen on either side, invisible power relations are invoked, even if only silently. Even this situation, though, can turn into a Deaf Gain when negotiation takes place. The premise that linguistic relations give rise to an invisible camp of micropowers established in systems parallel to the official system cannot be ignored.

The subject of sign language has been taken up in discussion circuits that have never existed before and creates a new correlation between linguistic, cultural, and ethical forces. This is also a Deaf Gain for the whole of society in Brazil. For example, the visibility of a lecture that is interpreted into Brazilian Sign Language is undeniable. Simultaneous interpreting is an indication that there is a Deaf "audience," that its right to the information has been given importance, and that a linguistic policy has been translated and implemented. Finally, the institutional formalization of the Brazilian Sign Language as a core discipline allows this knowledge, which for a long time was not considered, to be reconsidered.

Brazilian Sign Language: Establishing Priorities for Deaf Teachers

The legislative priority given to Deaf people for teaching Brazilian Sign Language is a significant Deaf Gain, because it reflects the recognition that Deaf people have a singular linguistic and cultural potential that requires social and political investment. The importance of Deaf Brazilian Sign Language teachers is not restricted to language teaching, as they contribute Deaf norms effectively to various areas within the education process.[8] Adapting to the visual constitution of knowledge is important in order to change the predominant logophonocentric perspective. In short, students have the opportunity to access Libras through Deaf eyes. This is a Deaf Gain.

Moreover, interactive situations depend both on a certain level of sympathy

transference in the professor–student relation and on the pedagogical interactive processes that can be established effectively between Deaf teachers and Deaf students. This relationship can produce significant effects on manifesting student potential. Thus, the presence of Deaf teachers in Deaf-education institutions can help to disarticulate the long process that identified Deafness as a handicap. In this way, the identity perspective of a Deaf person as a social agent is established. Such kinds of representation contribute to the reeducation of society's vision of different ways of social participation. Such contexts are being observed at the UFSC and the IFSC, where there are Deaf professors.

In education, Deaf teachers develop pedagogical strategies such as performance, storytelling, and visual-arts production, which are indispensable areas of Deaf education. As Karin Strobel points out, Deaf people present cultural artifacts that reflect the singularity of their visual, linguistic, literary, sporting, political, and material experiences, as in their use of technology.[9] In this way, one can assert that Decree 5626 supports a valorization of the Deaf professional-training process. However, the implementation of such training does not happen without a paradigmatic tension arising from opponents of this vision who try to debunk this approach. Despite such conflicts between different concepts of inclusion, the project for Deaf education in the context of higher education has been significant in recent years, with 867 Deaf students starting degrees in Brazilian Sign Language at UFSC. In addition, 371 Deaf students graduated at the undergraduate level, 12 Deaf students graduated with a master's degree, and 4 deaf students obtained a doctorate degree.

At UFSC, six Deaf professors have regular full-time, tenured positions. Similarly, other Deaf professors have been hired by other Brazilian universities.

Brazilian Sign Language and Brazilian Portuguese Usage and Diffusion for Deaf People's Access to Education

There is a huge Deaf Gain from the prominence given in the law to the condition of Brazilian Portuguese as the Deaf community's second language. Recognition like this makes it necessary to dig deeper into the implications for the process of implementing a linguistic policy built on sign language rather than Brazilian Portuguese. In this context, Chapters IV and VI of Decree 5626 enshrine the following:

> IV—to adopt coherent evaluation mechanisms with the second language learning process, in the written exam corrections, valuing the semantic aspect and recognizing the linguistic singularity manifested on the formal aspect of the Brazilian Portuguese language.
>
> VI—Brazilian Sign Language and Brazilian Portuguese translator and interpreter training.

Deaf relations with Brazilian Portuguese start to figure within a comparative system of a second language and are used as an evaluative parameter. This is a concrete Deaf Gain in Brazilian society for the deconstruction of the monolingual ideology.

The discussion that provoked this legal decree cannot be separated from the general debate about identity and linguistic policies. In this sense, the theoretical perspectives developed by Homi Bhabha, Walter Mignolo, and Stuart Hall contribute to the analysis of the colonial relationships between deaf and hearing people in Brazil.[10]

The Deaf gains of professional people in the areas of translation and interpreting are undeniable. The policy regarding Brazilian Sign Language translation and interpreting has developed little by little, not only with higher-education courses, for example, but also with bachelor's degrees in Brazilian Sign Language (called Letras Libras) to train Brazilian Sign Language translators and interpreters, and with the effective insertion of the Deaf into a society that will guarantee their rights. In addition, in postgraduate study, sign-language training for translators and interpreters now has its own space within the field of translation studies, with academic recognition guaranteed. UFSC has just started offering a specific research program, interpreting studies, to meet this demand.

The consolidation of a formal academic interpreter training leads to a domino effect. The prominence of this profession also entails a gain for the Deaf community that extends through the rest of society, in that it is no longer subject to constraints relating to the usage of its second language. This is especially true in the case of Brazilian Portuguese in its spoken modality, because of the presence of sign-language interpreters in a variety of formal situations.

Another Deaf Gain has been in the field of translation, occupied particularly by bilingual Deaf people. A new profession has come about through the creation of Brazilian Sign Language undergraduate courses: the Deaf translator-actor. Texts in Portuguese are translated into the Brazilian Sign Language by translators who are studying sign-language translation, the majority of whom are Deaf professionals. They have developed specific methods for performing their translations within a Deaf norm,[11] observing at the same time issues such as faithfulness to the source text in the source language (Portuguese, in this case). Translations such as these have been described by Rimar Ramalho Segala and Saulo Xavier Souza, for example.[12] The Deaf norms of the translators are related to discourse organization, for example, in the use of written words with visual hints, a kind of glossary with pictorial representations in sign-word order, as a strategy that drives discourse in the target sign language. Brazilian Sign Language translators are essential for guaranteeing that Brazilian Portuguese texts will be available in the corresponding Libras in educational spaces. Translation also represents a gain for the translation studies area: the research that is being developed in sign-language translation and interpretation studies has an impact on translation studies, es-

pecially in regard to intermodality, including interlinguistic and intersemiotic analyses of translation and interpretation products. To translate sign language to a spoken language or vice versa, there is a modal effect of sign language being gestural-visual. This means that when sign language is involved, there is always an interlinguistic process associated with an intersemiotic process, as sign language has signs and gestures in a single modality. Matters were more separate when two spoken languages were involved. However, the change in the paradigm brought about by sign languages can bring new approaches to translation studies.[13]

The presence of Deaf translators contributes to a Brazilian Sign Language course with a possible Deaf norm.[14] The foundation of the whole educational process is consolidated through social interactions.

The institutionalization of sign-language interpreters and sign-language translators represents Deaf Gain, because these people integrate bilingualism that starts to be established at a national level. The deconstruction of the monolingual society takes place through the presence of other languages. These professionals, together with Deaf communities nationwide, make the Brazilian Sign Language (Libras) visible.

Deaf Rights to a Bilingual Education

Chapter VI of Federal Decree 5626, Article 22, Paragraph 1, describes precisely the following: "[B]ilingual schools or classrooms are those in which Brazilian Sign Language and the written modality of the Portuguese Language are used for instruction throughout the entire development of the educational process." Even though doctors, audiologists, and speech therapists still question the effects of Deaf people's being exposed to sign language, this law recognizes Deaf bilingual education. The law avoids controversial perspectives about the relevance of sign language to Deaf education. This legal position is crucial for families with Deaf children, as they have the right to precise information about the importance of sign language for their children.

The deconstruction of a Brazilian monolingualism is vital to meeting the real demands of a population comprising various ethnic groups and linguistic singularities so that they are respected and answerable. In this sense, movements for sign languages and Deaf education have contributed to the opening of the general debate on difference policy.

The policy aspects of Brazilian Sign Language cited here require linguistic planning and effective actions to its implementation. In the following sections, we will approach the consequences of Federal Decree 5626 in the ambit of UFSC and IFSC.

Network Establishment through Deaf Education: A Strong Deaf Gain

The UFSC offers training programs for Brazilian Sign Language researchers in two modalities: e-learning and face-to-face courses. The e-learning course is

being offered nationally in fifteen states within Brazil under the official seal of the UFSC, as well as in partnership with other local public universities. This course was arranged for the Deaf, in other words, from its inception; the method of teaching and learning was thought through with Deaf scholars to guarantee the success of the learning-teaching process.[15]

One of the gains is Deaf–Deaf meetings in the context of e-learning education. These were created to count on Deaf ways of arranging the learning and teaching process through a very well established network for the virtual environment of teaching and learning (VETL). Deaf understandings have changed and contributed to the understandings applied to other undergraduate courses offered in the e-learning modality. The visual arrangement of the VETL with a Deaf format, through the usage of schemata and items, has favored the teaching process. This same pattern has started to be used for other e-learning courses offered by the university. Thus, Deaf understandings have modified institutional understandings in the context of formal teaching in the e-learning modality.

As well as this course, UFSC offers an undergraduate course to train Brazilian Sign Language translators and interpreters in the two modalities of teaching. The training process of these professionals is a Deaf Gain, because access to information is given through bilingual professionals. The qualification of the sign-language translators and interpreters has become essential, because the Deaf have started to hold positions inside and outside the university that require more qualified sign-language professional translators and interpreters. The performance levels of these professionals have risen significantly. They now have access to their education following a Deaf norm.

The virtual spaces for teaching include collaborative spaces that can be restricted to a local group or opened to every student in the country. Since the beginning, Deaf students have used the collective spaces as effective learning spaces. From the e-learning education managers' perspective, these collaborative spaces have taken on a greater dimension in the Letras Libras courses. There is a culture based on the establishment of contact networks through Deaf-to-Deaf meetings. This is historical in the Deaf community, dating to even before the advent of the Internet and improvements to new technologies. Deaf people contact each other from the North to the South, the East to the West quickly and efficiently. Whereas once they passed information face-to-face,[16] their need for contact is now empowered by Internet technology that breaks down distances through synchronized video exchange.

Deaf Gain is characterized here by the meeting of Deaf people who deconstruct the old culture, which was based on marginalization. The deconstruction of myths about Deaf people is being replaced by visual experiences and Deaf traditions. Gladis Perlin and Karin Strobel have discussed Deaf–Deaf meeting representations and the enforcement of Deaf identities.[17] The network established in

the Letras Libras courses is an example of this. What the Deaf used to do without technology some years ago has now taken on a new dimension: fifteen states were connected through virtual-environmental spaces in which more than eight hundred Deaf people could communicate using Libras and written Portuguese. These spaces were used as Deaf–Deaf meeting places, not only for the purpose of knowledge sharing but also for empowering Deaf organizations in the country.

Initially, all the students in the first group (500 students, with 447 Deaf among them) had access to all the messages posted in the VETL. However, the participation was so intensive that tutors had to request group creation by each unit so that participants could better control the interactions that were under their responsibility. We provided the group creation but, to the VETL managers' surprise, there were complaints from students who considered the contact among all students throughout the country to be an essential part of the learning process. The Deaf students always interacted with their colleagues from around the whole country, which was different from the experience of students from other e-learning courses managed by UFSC. The reaction of the Deaf students provoked an interactive-space review at the VETL. As a result, common spaces were created for all students so that they could all interact with every unit in the country, as well as locally within each unit (this first group of students counted on nine units throughout nine Brazilian federal units). With the second group, which brought more than 450 Deaf students to the Sign Language Program and 450 students to the Sign Language Interpreting and Translation Program, common spaces were already established. More units were added to the first nine, totaling fifteen units around the country. Deaf people took advantage of this network for their own purposes: Deaf–Deaf meeting spaces constitute a true Deaf Gain. The virtual Cyber Café is an interaction space used by students in every course in the whole country. The students take advantage of the national dimension of the common space to debate questions related to their course and to political questions. The common space is also a leisure space. Students empowered the Cyber Café space to establish Deaf–Deaf meetings. From this network, Facebook became popular, and specific spaces for Deaf–Deaf meeting were created there. This network of Deaf students has also been empowered by other available technologies.

In May 2011, four thousand Deaf people in Brazil organized themselves in the capital of the country, Brasilia, to stand up against mainstreaming policies for Deaf education. Deaf people used their network contacts to empower the Deaf–Deaf meetings that were already part of the Deaf community, but now in another, much more powerful dimension. After the 2011 protest, Deaf people used the network to mobilize the whole country, including not only Deaf people but also all hearing people who could make the movement stronger. They organized public audiences in seventeen states in the country with the local representative justice ministers to deliver formal documents explaining why Deaf education needed to

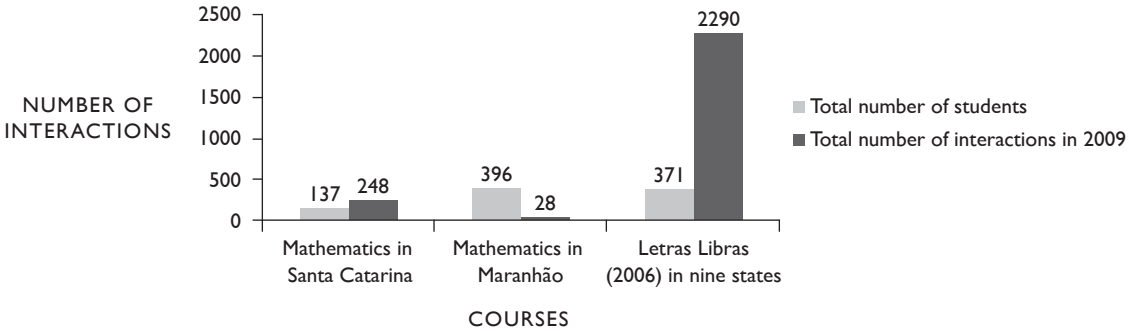


Figure 20.1. Social network in Brazil by course: average number of interactions by students in e-learning undergraduate courses during 2009.

take place in bilingual schools instead of regular schools. This organization happened through social networks available on the Internet. The huge Deaf Gain here is the empowerment of Deaf–Deaf meetings using these networks as tools.

These spaces became spaces for social interaction as well. Effectively, virtual spaces for interaction are a Deaf Gain, as they have become appropriate vehicles for the subjective expression of the Deaf. The data comparing the use of these virtual spaces as collaborative spaces by Deaf students and hearing students reveal huge differences within a single university. The number of accesses and effective interchanges during 2009 at UFSC in the Letras Libras course for Deaf students was considerably higher than other accesses by students in the two e-learning math courses for hearing students only (Figure 20.1).

The modality effects of sign language require the organization of new teaching systems with visual tools. For example, all the classes at UFSC are prepared by designers in sign language, materials are produced in sign, and evaluations are organized using sign language. The sign-language teacher, translator, and interpreter training courses present this perspective as part of their teaching and learning approaches. The Deaf students use intensively collaborative spaces to teach in sign language, as well as in written Portuguese-as-a-second-language, which is also recognized. (Libras became the instructional language, so Portuguese is no more a factor of exclusion. Deaf people started to use Portuguese without being worried that they would be evaluated in their usage. Written Portuguese-as-a-second-language circulated throughout academic activities, alternating with Libras in movies posted by the students.)

By the end of the courses, several Deaf students said that they had learned Portuguese better, even though this was not the goal of the courses. They were in a safe place to use their second language in their own ways. This made them learn more about the language and empowered their bilingual status, which is an intrinsic Deaf Gain.[18]

As Ana Regina e Souza Campello states, Deaf pedagogies or visual pedagogies are the best way of teaching and learning for Deaf people.[19] Social networks are visual tools Deaf people use to empower their learning processes, and given that this works, it may help to improve e-learning systems. This, too, is a Deaf Gain.

As Vilmar Silva argues, the social network that has been empowered by Brazilian Deaf people involves spaces in which they share their language, their culture, and their differences, as well as develop complex ways of spreading their knowledge.[20] Deaf people are social agents; they form these networks, making and deconstructing their own paths, making it impossible to define their strategies of organization merely as closed systems. Different groups form different networks, and Deaf people integrate them into their everyday lives and in their social movements. They make it possible to diffuse common needs and spread them quickly throughout the whole country, connecting local and broader needs. These connections through the Internet disseminate knowledge as well as strategies of articulation by Deaf people that can offer new readings of the world and can contribute to new meanings for possible social and cultural transformations. In this sense, these social networks empower spaces of negotiation, even when they are divergent or conflicting.

Deaf Cultural Marks at UFSC and IFSC

In the Letras Libras program at UFSC and the Bilingual Unity program at IFSC, there are now spaces in virtual environments, including DVDs and videoconferences, in which Deaf actors translate academic texts from Brazilian Portuguese to Brazilian Sign Language in various disciplines. These materials have been linguistically and culturally adapted by the instructional designers with the goal of making the materials accessible to Deaf students.

Such visual materials are a Deaf Gain incorporating Deaf senses that can improve education for everybody, as is mentioned by these Deaf researchers: "Visual experience means the usage of vision (in total substitution to the hearing form), as a form of communication. From this visual experience emerges a deaf culture represented by sign language, by the different way of being, expressing, knowing the world, entering the arts, scientific and academic knowledge."[21] In accordance with this idea, we have come up with a cultural and pedagogical model that places emphasis on the Deaf way of teaching, which demands visual-teaching strategies, sign-language knowledge transmission, and Deaf professors' presence at schools and universities. These visual-teaching strategies start with visual contact between teachers and students. This is an interesting approach, as all the material is available through videos. When we started to produce videos for this purpose, our Deaf translator was looking at cue cards below the camera. Students complained that the Deaf translators were not looking at them. This led us to change the method of presenting the cues the Deaf translators needed for their work: we started using a teleprompter. Another situation was the presence in the videos of

hearing teachers with sign-language interpreters. Students complained about the size of the sign-language window on the screen. So, we put the hearing teacher in a small window in the corner of the screen, in contrast to the whole body of the sign-language interpreter. However, this was still visually uncomfortable, as the head of the interpreter was a kind of visual "noise."

Deaf students have made notes and filmed others in sign language with cameras, indispensable objects that have now been rapidly overtaken by mobile phones, which are continuously used to take pictures, make films, and text messages. All this technology has empowered Deaf–Deaf meetings, because they enable face-to-face contact, even if not in a shared space. Such technological tools influence proximity among Deaf people and have become a kind of cultural artifact that helps to construct social relationships, defend against threats to Deaf identities, transmit cultural values, and motivate the exchange of experiences about Deaf identity and the celebration of Deaf people.

The Deaf–Deaf meeting seeks to unify the Deaf community as a singular cultural identity in an affirmative perspective, so that it can be seen by everyone as a single group. This is very important for the organization of the Deaf community inside the hearing community. This is the way to transformation, in which the recognition of a strong organization enables negotiation with others.[22] According to Gladis Dalcin, the Deaf feel like strangers inside their own families.[23] This occurs because of the language barrier, which makes it hard for the Deaf to have the same kind of familial identification that the hearing do. Identification, for the Deaf, occurs inside the Deaf community, where they create these spaces empowered by technology.

In relation to national cultural identity, Owen Wrigley makes an interesting remark: "Deafness is a country without a proper 'place.' It is a citizenship without a geographic origin."[24] This may also explain why the social networks available through the Letras Libras course are a very strong means of empowering Deaf relationships. We present a story from Sueli Fernandes: "[T]he mother comes into the room and finds the curious and afflicted gaze of the Deaf daughter in front of the world map. Her gestures expressed anxiety by receiving an answer that would help her to understand what was going on: 'Mum, the Japanese live in Japan; here is Germany, the country of the German people; Italy, that is the nation of the Italians; where is the Deaf country, mum? Where is my nation?' "[25] Deaf subjects, as holders of a different culture, feel like foreigners in their own society. They are in the buses, malls, and universities, cheering for the same soccer teams, enjoying eating rice and beans, living in the same country, ethnically formed by the same African, Portuguese, and Amerindian ancestors and some Italian and Japanese and German ancestors in the southern part of the country. A Deaf male baby is given blue clothes and a ball, and a Deaf female baby pink clothes and a doll. As Wrigley mentions, Deaf people are a country where history has been rewrit-

ten over generations and sign-language cultures, as the social knowledge of Deaf people is made again and again by each generation.[26] The Deaf community itself is the Deaf country. Thus, Deaf–Deaf meetings are crucial.

How is culture created and transmitted unless by language? If Deaf and hearing people do not share the same linguistic code, how can they share a culture? It is possible to have interchanges thanks to language competence, but each group must have its own cultural space in which to identify itself. Deaf and hearing worlds construct cultural experiences of their collective identities. For example, every year, the Letras Libras students arrange the National Meeting of Letras Libras Students (ENELL) in different Brazilian regions. During the first, second, and third editions of the ENELL, the great majority of the participants were Deaf students, because for them this kind of event was essential to organizing Deaf–Deaf meetings.

In these terms, Deaf–Deaf meetings represent the possibility of sharing the meanings of identity constitution. Thus, the other is someone who uses the same language, who can construct possibilities for effective interchange, and who can share a significant political process that makes sense in Deaf terms. It was from the Deaf desire to be part of a group of Letras Libras students who shared the same way of being and communicating that we noticed that these were determinant factors in the process of raising the Deaf identity. Therefore, in the face of the "discomfort" felt by Deaf people in relation to the hearing culture and of their bewilderment in seeing others behaving differently from themselves, they built up a new approach, a new way of seeing themselves, and they sought to find their own identity in relation to their own group.

For these Deaf students, it was the academic Deaf–Hearing relationship that inspired groups to manifestly seek out the value of their own culture and the recognition of their own rights and values. This initially came about through achieving official recognition of their language from the authorities through Federal Law 10.436, which recognizes Brazilian Sign Language as the first language of Brazilian Deaf citizens. This was followed by Federal Decree 5626, which has made it possible to expand Deaf teacher training in several university environments.

Final Remarks

The bilingual educational perspective of Deaf milestones anticipates the awareness of Deaf subjects about the significance of being Deaf, which, until just a short time ago, happened only when Deaf people became adults. Deaf ways of learning and teaching use Deaf–Deaf meetings as the basis for development. The social and educational networks of Deaf people that are used in educational centers have proved to be a Deaf Gain. The Deaf–Deaf meaning, as Wilson Miranda has pointed out, is the key to empowering the Deaf community.[27] It allows for the possibility of constructing Deaf identities as people and as social agents. The network

at Letras Libras has shown this potential connection as an empowering social and cultural tool. We will end with a quote by a Deaf teacher, collected by Silva in his research on Deaf milestones:

> The networks of contacts among Deaf people have long existed. Deaf associations played an important role in constructing Deaf networks. The research that we conducted shows that these networks had important effects on the lives of Deaf people. Social networks are milestones of Deaf social movements. We now have strong networks through FENEIS (National Federation of the Deaf) and *Letras Libras*, which in the past were represented by Deaf Associations and informal person–person contact among Deaf people. This was the first form of social network that Deaf people used to enable contact among themselves. I think that all these social networks are focused on the celebration of sign language, which empowers Deaf people around the country.[28]

Notes

We thank Joseph Murray (Gallaudet University) and H-Dirksen Bauman (Gallaudet University) for their comments on a previous draft of this chapter.

1. Jacques Derrida, *Gramatologia* (São Paulo: Editora Perspectiva, 2004).
2. Ronice Müller de Quadros, "Políticas Lingüísticas e Bilingüismo na Educação de Surdos Brasileiros," in *Lingüística Luso-Brasileira,* ed. Ana M. Carvalho (Madrid: Iberoamericana Editorial Vervuert, 2009), 215–35.
3. Noriko Lúcia Sabanai, "A Evolução da Comunicação Entre e com Surdos no Brasil," *HELB* 1, no. 1 (2007), accessed on January 25, 2011, http://www.helb.org.br/; Ronice Müller de Quadros et al., *Exame Prolibras* (Florianópolis, Brazil: Universidade Federal de Santa Catarina, 2009).
4. Louis Jean Calvet, *As Políticas Linguísticas,* trans. Isabel de Oliveira Duarte, Jonas Tenfen, and Marcos Bagno (São Paulo: Parábola Editorial; IPOL, 2007).
5. H-Dirksen Bauman, "What Frames of Reference Have We Used to See Deafness in Deaf People?," Canadian Hearing Society, accessed December 2011, http://www.chs.ca/.
6. Mary Louise Pratt, "Arts of the Contact Zone," in *Ways of Reading,* ed. David Bartholomae and Anthony Petroksky, 5th ed. (New York: St. Martin's / Bedford, 1999).
7. Michel Foucault, *A Arqueologia do Saber* (Petrópolis, Brazil: Vozes Centro do Livro Brasileiro, 1972).
8. Christopher Stone, *Toward a Deaf Translation Norm* (Washington, D.C.: Gallaudet University Press, 2009).
9. Karin Strobel, *As Imagens do Outro sobre a Cultura Surda* (Florianopólis, Brazil: Editora UFSC, 2008), 118.
10. Homi Bhabha, *O Local da Cultura,* trans. Myriam Ávila, Eliana L. L. Reis, and Gláucia R. Gonçalves (Belo Horizonte, Brazil: UFMG, 1998); Walter Mignolo, *Histórias Locais/Projetos Globais: Colonialidade, Saberes Subalternos, e Pensamento Liminar,* trans. Solange Ribeiro de Oliveira (Belo Horizonte, Brazil: UFMG, 2003); Stuart Hall, *A Identidade Cultural na Pós-modernidade,* trans. Tomaz Tadeu da Silva and Guacira Lopes Louro, 7th ed. (Rio de Janeiro: DP&A, 2003).
11. Stone, *Toward a Deaf Translation Norm.*

12. Rimar Ramalho Segala, "Tradução Intermodal e Intersemiótica/Interlingual: Português Brasileiro Escrito para Língua Brasileira de Sinais" (master's thesis, Universidade Federal de Santa Catarina, Florianópolis, Brazil, 2010); Saulo Xavier Souza, "Performances de Tradução para a Língua Brasileira de Sinais Observadas no Curso de Letras-Libras" (master's thesis, Universidade Federal de Santa Catarina, Florianópolis, Brazil, 2010).
13. Renata Krusser, "Design de Objetos para Aprendizagem Bilíngues (Libras/Português)" (doctoral diss., Universidade Federal de Santa Catarina, Florianópolis, Brazil, forthcoming).
14. Stone, *Toward a Deaf Translation Norm.*
15. Marianne Stumpf and Ronice Müller de Quadros, "First Graduation Program in Brazilian Sign Language," in *Abstracts Book of Presentations and Papers of the 15th World Congress of the World Federation of the Deaf* (Madrid: World Federation of the Deaf, 2007).
16. Vilmar Silva, "A Política da Diferença: Educadores-Intelectuais Surdos" (doctoral diss., Universidade Federal de Santa Catarina, Florianópolis, Brazil, 2009); Wilson Miranda, "Comunidade dos Surdos: Olhares sobre os Contatos Culturais" (master's thesis, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil, 2001); Gladis Perlin and Karin Strobel, "Fundamentos de Educação dos Surdos" (lecture, Universidade Federal de Santa Catarina, Florianópolis, Brazil, 2006).
17. Perlin and Strobel, "Fundamentos de Educação dos Surdos."
18. H-Dirksen Bauman and Joseph Murray, "Deaf Studies in the Twenty-First Century: 'Deaf-Gain' and the Future of Human Diversity," in *The Oxford Handbook of Deaf Studies, Language, and Education,* ed. Marc Marschark and Patricia Elizabeth Spencer (Oxford: Oxford University Press, 2010), 2:210–25.
19. Ana Regina e Souza Campello, "Pedagogia Visual na Educação de Surdos-Mudos" (doctoral diss., Universidade Federal de Santa Catarina, Florianópolis, Brazil, 2008).
20. Silva, "A Política da Diferença."
21. Gladis Perlin and Wilson Miranda, "Surdos: O Narrar e a Política," *Ponto de Vista,* no. 5 (2003): 218.
22. Paulo Freire, *Pedagogia do oprimido* (Rio de Janeiro: Paz e Terra, 1987).
23. Gladis Dalcin, "Um Estranho no Ninho: Um Estudo Psicanalítico sobre a Constituição da Subjetividade do Sujeito Surdo," in *Estudos Surdos,* ed. Ronice Quadros (Petrópolis, Brazil: Arara Azul, 2006).
24. Owen Wrigley, *The Politics of Deafness* (Washington, D.C.: Gallaudet University Press, 1996), 11.
25. Sueli Fernandes, "Educação Bilíngüe para Surdos: Identidades, Diferenças, Contradições, e Mistérios" (doctoral diss., Universidade Federal do Paraná, Curitiba, Brazil, 2003).
26. Wrigley, *The Politics of Deafness,* 25.
27. Miranda, "Comunidade dos Surdos."
28. Silva, "A Política da Diferença."

21

DEAF GAIN
Beyond Deaf Culture

IRENE W. LEIGH, DONNA A. MORERE,
AND CAROLINE KOBEK PEZZAROSSI

Normalcy has been idealized as the standard, as an aspirational goal for people, thereby implying that those individuals who do not meet that standard belong on the fringes of society. However, for decades, scholars have argued about the meaning of normalcy and the value of diversity. There are writings that zero in on whether diversity can be a valued attribute. For example, John Harris extols the importance of enhancing evolution to minimize undesirable attributes or maximize desirable attributes.[1] In contrast, others, such as Christopher Krentz and Michael Sandel, argue against the notion of genetic engineering designed to dilute the variability that is part of the human condition.[2] Lennard Davis has observed that enforcing normalcy as an inclusive standard covering human diversity in the guise of various body states has yet to happen.[3] The implication, therefore, is that in order to succeed in normalization and become as close to "normal" as possible, deaf people need to follow the "normal" parameters of society in the guise of spoken-language and hearing cultural ways of being.

But "normal" is not a comfortable cloak for many. Individual differences abound in all of humanity. To package these differences into one box is to deny what it means to be unique individuals. Deaf people have long since recognized that they are but one example of individual differences. Yet for this they have been "damned for their difference,"[4] particularly while showing "signs of resistance" against efforts to minimize that difference through the suppression of signed languages and the focus on spoken language.[5]

With the advent of ongoing changes in hearing technology, including the development and popularization of new generations of cochlear implants, it is clear that the message of normalization continues. Cochlear implants have been touted as a means of placing deaf persons "on track" to achieve immersion in their hearing societies. Numerous studies of children with cochlear implants have examined speech development, language development, auditory development, and socialization.[6] For the most part, it appears that many children with cochlear implants are

functioning essentially as hard-of-hearing children, a group that has its own set of problems in dealing with mild to moderate hearing loss.[7] Whether this represents a sort of gain depends in large part on individual experiences. Although results in academic achievement for children and youth with cochlear implants appear to exceed those of their deaf peers who do not have the implant (definitely a positive gain), they still are not equal to the norms for hearing peers, and results tend to be quite variable.[8]

Socially, with immersion in mainstream programs, there are success stories illustrating the resiliency of deaf children with cochlear implants who are able to overcome challenges such as accessing group conversations and dealing with the ambient noises of their surroundings, in large part because of their ability to identify auditory information.[9] But many have difficulties at times, suggesting that enhancing one's fullest potential may be relatively more difficult because of the lack of skills in identifying sounds and the interfering noise that accompanies group participation.

As is amply documented in this book, Deaf Gain is an effort to announce to the world at large that there are, in fact, gains to being deaf and to Deaf ways of being, primarily in "reframing representations of deafness from sensory lack to a form of sensory and cognitive diversity that offers vital contributions to human diversity."[10] As indicated by H-Dirksen Bauman and Joseph Murray, subsumed under the overall concept of Deaf Gain are the concepts of deaf benefit (gains to the individual) and deaf contribute (gains for humanity).[11] Through these concepts, Deaf Gain attempts to reframe the value of deaf lives and to counteract the notion that deaf people need to be "normalized" in the process of attempting to eradicate the disability of deafness.[12] The paramount premise of this concept appears to be that living within a visual-spatial context contributes to the richness of life and human diversity. This contravenes the historical Western reliance on the sense of hearing as the paramount conduit for the richness of life and human diversity, and in particular for hearing and receiving language.[13]

The Deaf Gain paradigm supports the premise that languages carry the weight of significant meaning when conveyed via a visual medium, as much as or even more than when conveyed through auditory means. Bauman and Murray make a strong case for the way cognitive, linguistic, and cultural diversity as exhibited by Deaf communities throughout the world can expand the notions of linguistic diversity and biodiversity. They advocate for the need to reframe hearing loss as Deaf Gain, to enhance the notion of Deaf as a unique way of life that emphasizes the advantages of being Deaf. They clarify the contributions of "a sophisticated form of visual-spatial language that provides opportunities for exploration into the human character" as an example of Deaf Gain.[14]

Although there are critical advantages to viewing Deaf Gain through the lens of visual-spatial languages, including a sense of how they enhance ways of understanding the world, we appreciate that there are more broad conceptualizations

of Deaf Gain that go beyond the paradigms of Deaf culture per se. As Joseph Michael Valente, Benjamin Bahan, and H-Dirksen Bauman suggest, insufficient attention has been paid to how the use of the eyes in different ways, whether in conjunction with or apart from any language per se, has expanded our understanding of the world.[15] For example, the burgeoning new field of DeafSpace speaks to both the notion of space and time as viewed through the lens of visual ways of seeing the world and the enhancing of one's place in space, depending on location and function.[16] The principles on which DeafSpace is predicated are based on knowledge about aesthetics in general, principles that hopefully will facilitate the future creation of spaces and buildings for all peoples. This aesthetic has been around for a long time, as witness buildings that are open and airy in space. There are many people, both deaf and hearing, outside the realm of "Deaf" who also see the world uniquely through a visual lens, the most obvious example being architects, but beyond that, artists who illustrate the gain of vision in portraying the world or in dealing with worldviews in diverse visual ways. In addition to architects and artists, there are also engineers, fashion designers, and psychotherapists, among others, whose livelihoods depend on their visual sophistication and their visual skills in analyzing their environments and the visual expressions that people exhibit, not all of whom rely on signed languages or vision alone to communicate with their worlds.

We do understand that Deaf Gain is predicated in part on the premise that visual languages significantly and uniquely contribute to the understanding of human diversity. Although this is a critical component, we also support the proposition that Deaf Gain or vision gain, in particular the unique ways in which deaf people use their visual capabilities in conjunction with, or separately from, their auditory capabilities (enhanced by technology), is just as valid a concept for critical analyses of those individuals who do not consider themselves members of a Deaf culture. More specifically, we support an additional focus on how deaf persons who are not necessarily affiliated with Deaf culture manage their environments and how they use their vision in ways that may not be similar to those of their hearing peers.

Demographics provide support for the need to consider this section of the deaf population. Specifically, the estimated number of individuals in the United States exhibiting mild to profound levels of deafness is approximately 34 million, with most of them experiencing late-onset hearing loss, starting in the mild range.[17] For those with severe to profound levels of deafness, the estimated prevalence falls roughly between 464,000 and more than one million.[18] The prevalence for those who are hard of hearing is roughly 10 million, making this group far larger than the group who are classified as deaf. Ross Mitchell and colleagues have extrapolated data from a 1974 census to suggest that individuals who rely on American Sign Language (ASL) number approximately 500,000.[19] The rest are not users of ASL.

The point of this demographic information is to emphasize the presence of a large "deaf" community in the United States, of which Deaf culture is one part, many of whose members consider themselves to be audiologically deaf and identify themselves as oral deaf persons or as individuals who happen to be deaf. This is also a community that is quite heterogeneous, a fact that is often overlooked when analyzing what Deaf culture represents, though we acknowledge that scholarly work is increasingly taking the diversity of culturally Deaf people into account.[20]

Who is the audiologically deaf person, or, more popularly, the oral deaf person? The most common description is a person who typically exhibits a preference for spoken languages and interacts primarily with hearing peers.[21] But these individuals also have feelings of affinity with deaf peers who follow similar lifestyles.[22] They typically strategize ways to improve auditory access in addition to relying on their vision to orient themselves to their environment. Worthy of note as well is the fact that gradually increasing numbers of culturally Deaf individuals are also open to diversifying their sensory experiences not only with the use of hearing aids but also with cochlear implants.[23] They value the use of their eyes but also want to expand on their sensory experience of their world, just as those deaf individuals who rely on spoken language do. Consequently, it is beneficial for us to examine how the concept of Deaf Gain benefits all within the diverse deaf population.

We would like to reemphasize the premise that Deaf Gain is not just the contribution of visual-spatial languages to our understanding of human nature and human connection but also a way of relating to the world through the eyes in addition to the other sensory experiences the human body and culture make possible. Considering the fact that deaf youngsters continue to be initially exposed to spoken language early in life, with a good number of them also being exposed to sign language in the early years with demonstrated benefit, it behooves us to learn more about how deaf individuals process information through spoken language and how they benefit from the combination of vision and sound as hearing people do or even beyond what hearing people do.[24] For example, there is a phrase, "hearing eyes," that some deaf persons use to connote the way hearing people sometimes ignore subtle visual signals indicating that they are creating environmental barriers, such as not moving to the side to allow foot traffic through because they do not easily visualize themselves in space, signals that deaf people, whatever their linguistic status, often effectively notice, as based on anecdotal information.

It is also important to recognize that hearing people are not solely auditory users in connecting with their worlds. As Johan Lundstrom noted, what was thought to be the case for each sense in isolation isn't necessarily true, considering that the brain manages information from multiple sensory sources simultaneously, for example, noticing smell with sight to create a construct that combines both.[25] He provides the example of smelling rose oil while looking at a photograph of a rose; this leads to a more intense sensory experience. In this regard, there are

implications related to the intertwining of vision and audition that can represent a gain for deaf persons.

We now turn to a review of the research evidence on the visual-spatial strengths of deaf people. This research shows that deaf individuals benefit not from the use of vision alone but from the combination of visual and auditory input, a combination that hearing people also benefit from despite their implicitly assumed reliance on audition alone.

Research on Visual and Bimodal Processing

In view of the desire for the "normalization" of deaf children, given that the vast majority of them are born to hearing parents, most deaf children are exposed to some level of spoken language from an early age regardless of the decisions made concerning the communication method to be used with them. Furthermore, because of advances in technology—both cochlear implants and digital hearing aids—increasing numbers of families are initially focusing on communication through spoken language for their deaf children. Thus, it behooves us to learn more about how deaf children process information through spoken language and how they benefit from either vision alone or the combination of vision and sound, as hearing people do when processing spoken language.[26]

Visuospatial skills involve the reception, analysis, and use of visual information and the understanding of the spatial relationships among objects (including other people) in the environment. Visuospatial analysis represents an integration of the information a person is currently seeing, the person's existing knowledge of the types of objects seen and typical relationships of those objects, and other sensory information, including audition and the body senses (such as touch, balance, and kinesthetic information). So, for example, if a person sees a glass of water in front of a television, he or she understands that the glass is closer, because it obscures part of the television, and the person's understanding of the glass's position in space relative to him or her and the awareness of the position of his or her own body allows the person to reach for the glass in space with a high level of accuracy. This process involves multiple areas of the brain working in an interactive manner.

Vision is initially processed in the occipital lobes, located in the lower portion of the back of the brain. Here, basic information about light and color is analyzed and integrated into lines, angles, and finally shapes. This information is then sent forward via multiple pathways, through one of which it is integrated with information from the other senses—particularly the body senses that provide information about where we are in space and our own body positions—and our knowledge of spatial information to tell us where the things we see are. A second pathway provides integration of the visual information with other sensory information, our knowledge of objects, and our language base to determine what the things we see are. The spatial, or "where," part of the information travels through what

is called the dorsal pathway, meaning that it travels through the upper sides of the brain to the parietal lobes (hands placed on the sides of one's head slightly above and behind the ears roughly cover the parietal lobes). The "what" part of the information travels through the ventral pathway, which runs through the lower part of the brain. This information is integrated in the lower part of the temporal lobes, roughly located beneath and behind the ears. A third pathway travels to the middle of the lateral surface of the temporal lobes and is involved in the analysis of specific types of movement. Recent research suggests that this area receives information from the other two streams as well.[27]

The upper surfaces of the temporal lobes are typically involved in the analysis of auditory information in a manner similar to the visual analysis occurring in the occipital lobes, as well as in the reception of language. Research suggests that both visual and auditory inputs are involved in the processing of receptive language in hearing as well as deaf populations.[28] The ventral visual pathway carries the visual shape information to the lower surface of the temporal lobes, where object recognition occurs. That is, this pathway allows us to identify objects that we see. The third, middle pathway travels to an area of the temporal lobes involved in the analysis of visual information to detect something called biological motion. Biological-motion perception, which has been found to be abnormal in individuals with autism-spectrum disorders, is important for social perception, or the understanding of social intentions and relationships.[29] This involves the integration of visual information such as gaze direction, head movement, mouth movement, facial movement and expression, and hand and body movement. These types of movements both distinguish living from nonliving objects and provide important cues related to social interactions and the intents of the individual being observed. Although this information relates to all animals, it has particular relevance for humans, who are highly social animals. This information typically reflects nonverbal communication in spoken interactions but may comprise part of the linguistic message in signed languages.

To date, most of the research on visuospatial functioning in deaf individuals has focused on Deaf or deaf signers and has suggested enhancement in a range of visuospatial processes.[30] Although little research has investigated the visuospatial impacts of deafness in the absence of a history of signing, Allegra Cattani, John Clibbens, and Timothy Perfect compared visual memory of deaf signers and nonsigners and found a relative increase in performance of deaf signers relative to the nonsigners (deaf and hearing) on memory for abstract shapes but not for objects.[31] This study suggests that more research needs to be done on the nonsigning deaf population as it relates to potential differential Deaf gains in visuospatial functioning separate from the outcomes obtained from signing groups.

One aspect of visual analysis that has been less studied is its involvement in the reception of spoken language. Some recent research has focused on this topic, yet much work remains to be done in this area, and minimal work has ensued related

to potential Deaf gains related to this process.[32] As we previously noted, most people use visual input, such as the information on the face and mouth, in addition to any available auditory input, during the reception of spoken language. That is, receiving spoken language reflects a combination of listening and speechreading for most people. Historically, it was believed that hearing people would be likely to be better speech-readers than those who were deaf; however, recent research has indicated that oral deaf individuals who depended on speechreading from an early age—especially those deaf from infancy—appear to have enhanced speech-reading skills relative to their hearing peers.[33] However, this does not appear to involve a general enhancement of visuospatial skills. Indeed, although Tara Mohammed and colleagues found that the deaf participants in their study were, on average, better speech-readers than the hearing participants, their performances on two measures of visual processing did not reveal any significant differences. Moreover, the hearing participants' performances on the visual tasks were not significantly related to their speech-reading scores, yet the deaf participants' speech-reading scores correlated significantly with their performance on a measure of perception of motion but not with one of perception of shape, or form. Although the stimuli used for this motion task were simply moving dots, the ability to detect when they were moving together (coherent movement) is believed to reflect perception of biological motion, or movement that appears to reflect speaking and communicating activities such as facial expressions, speaking, and walking. This type of information appears to be involved in the processing of social interactions, providing information about the intent of the individual. Thus, sensitivity to subtle aspects of biological movement—even in the absence of enhancement of skills in the detection of this motion—may contribute to enhanced speechreading in deaf individuals. Enhanced speech-reading skills enable individuals with high-level skills to understand speech in noise levels and at distances that would make auditory speech reception difficult to impossible. Such skills would enable these individuals to understand speech in situations in which those with more limited speech-reading skills would be unable to understand what was said.[34]

Significant research has suggested that both deaf and hearing individuals integrate auditory and visual information in the perception of speech, and that at least some of this integration occurs in what is typically considered to be the auditory cortex, or the area of the brain that normally analyzes sound.[35] Indeed, Riikka Möttönen, Martin Schürmann, and Mikko Sams found that during audiovisual integration tasks, the auditory cortex was activated before the area involved in analysis of biological motion.[36] Thus, this integration of vision and sound in the analysis of the speech signal to determine the literal speech signal (what he said) appears to occur automatically and to precede the additional analysis related to intent or social message of the speaker (what he really meant). Interestingly, Donna Morere's review found that a range of studies suggests that the analysis of biologi-

cal motion appears to be a key factor in speechreading.[37] Considering the dynamic nature of speechreading, and its dependence on multiple areas involved in biological motion, this makes a great deal of sense.

In hearing as well as deaf individuals, the visual signal arrives at the brain first (light travels faster than sound) and appears to prime the auditory cortex, speeding up speech analysis by limiting the potential set of phonemes from which the brain must choose.[38] That is, if the mouth is closed, the brain doesn't need to analyze the auditory signal to see whether the phoneme being received is /H/ or /G/. This increases the efficiency of the auditory analysis when the auditory signal is available. In the absence of the auditory signal, as in a profoundly deaf individual, the analysis must proceed based on the relatively limited speech-reading signal but appears to occur in this region regardless. Interestingly, Möttönen, Schürmann, and Sams found that the degree to which the auditory analysis was facilitated depended on the accuracy with which the phonemes were detected in a vision-only condition. This would suggest that individuals with enhanced speech-reading skills could best benefit from such a process.

Hearing individuals appear to use audiovisual inputs with a focus on the auditory in better auditory settings, and their dependence on the visual signal increases as the auditory signal is degraded or obscured, as in a noisy environment.[39] In contrast, deaf individuals appear to depend more on the visual aspects of the speech, but they take advantage of whatever auditory signal is available to clarify the information available through speechreading.[40] They appear to use many of the same areas of the brain for visual analysis of speech that are typically used for auditory speech analysis, regardless of the level of auditory functioning or available auditory input.[41] Furthermore, deaf children with better speech-reading skills who later receive a cochlear implant appear to develop better auditory speech perception than children with weaker speech-reading skills.[42]

Overall, deaf individuals appear to process spoken language in a manner similar to that of hearing individuals. Both use a combination of visual (speech-reading) and auditory (when available) input. The audiovisual input is integrated at a very basic and early level in the brain and is used to produce an optimal speech signal. However, whereas hearing individuals appear to use visual input to facilitate (speed up or clarify) the auditory signal, deaf individuals naturally depend more heavily on the visual signal and supplement this with any available auditory input. The research seems to suggest that deaf individuals process a higher level of visual speech in the auditory cortex and that this facilitates use of available auditory signals. Although it is unclear whether there are perceptual gains from a dependence on visual speech, research suggests that the speech-reading skills of deaf individuals far exceed those of hearing individuals. Furthermore, peripheral functions, such as visual attention, appear to be enhanced in deaf individuals regardless of whether the person uses signed or spoken language.[43] Thus, there appear to be

some areas of visual functioning that represent a generalized Deaf Gain, whereas other aspects of visual functioning may be enhanced through the language experiences of the individual, particularly during the developmental years.

Social Aspects of Deaf Gain

The old adage "Birds of a feather flock together" illustrates the basic human need of belonging to a group of individuals who have potentially similar backgrounds. But although there is a wealth of empirical information regarding forming bonds with people of similarity in the field of social psychology, there is limited research specifically geared toward the d/Deaf community and to the way individuals in that community bond. We attempt to explore this area within the paradigm of Deaf Gain, pertaining specifically to individuals who primarily use spoken languages.

Again, Deaf Gain is not only about language and visual aspects; it is also about bonding and connection, and recognizing one's unique ways of living. It is about recognizing resilience in the face of a world not always comfortable with difference. It is also about identity. Just as culturally Deaf people connect with each other, deaf people who rely on spoken languages also have their deaf ways of being, their use of the eyes in addition to whatever auditory enhancement they may experience with assistive devices, and their sense of togetherness and understanding when they get together.[44] There is a sense of recognition and commonality based on shared life experiences. Research has shown that feeling a sense of connection with another person improves physical and mental health.[45] Here, we will use general social-psychology concepts, general research findings, and anecdotal information to better understand the formation of friendships and the ways social support can enhance Deaf Gain.

Deaf people form tight bonds usually lasting through the life span. It is not only hearing status that bonds them; they are also bonded by shared experiences. Such experiences include educational background—the type of school attended, the teachers, other students, the languages used, and technology needs. Each deaf person uniquely experiences the sense of being deaf; however, it is not required that one join a Deaf cultural community in order to feel a sense of belongingness. Many do, but those who don't typically seek out other individuals who may have similar experiences in dealing with their worlds as deaf persons even as they immerse themselves in their local hearing communities.[46] The goal is to develop a healthy sense of self and to seek a sense of validation within themselves, best attained through relationships with others.

There are several organizations and groups whose mission does not include culture; the Alexander Graham Bell Association for the Deaf and Hard of Hearing is one such example. This national association hosts an annual conference where like-minded individuals within the deaf community gather to enjoy the sense of being deaf and relating uniquely with their worlds. These are not necessarily in-

dividuals who "come in from the cold" of their hearing worlds—though a number do—but rather people who come to share experiences.[47] This can be so successful that quite a few weddings have resulted from interactions at this national convention. Some sense of Deaf Gain is apparent here, in individuals' enjoyment of like-minded company and pride in who they are and how they have gotten to their places in life.

The sense of belonging and connectedness starts with attachment. Attachment to others is more than a dynamic between caregiver and child; it is also an important feature in forming friendships and a sense of community. It is generally agreed that a need to belong and a need to affiliate with groups are the impetus for forming friendships and relationships. Different levels of need are, of course, important to note; however, people share a drive to belong.

Research exploring the need to belong has a long history.[48] According to Mary Ainsworth, a sense of attachment drives people to seek out companionship and encourages people with similar backgrounds to seek each other out. Ainsworth also outlines a behavioral system that guides the idea of attachments beyond infancy. This system includes a wide variety of potential relationships between people. This relationship formation can range from occasional interactions to deep and long-lasting friendships. Although proximity is an important feature in the development of deep friendships, Ainsworth points out that individuals must recognize similar interests and activities in order to maintain friendship.[49]

Elliot Aronson notes that the fact that we tend to like those who appear to agree with our opinions is a sort of a social validation of our beliefs.[50] Aronson's theory of gain-loss in interpersonal attraction illustrates that despite the belief that liking begets more liking, friendships are formed by increasing positive and rewarding interactions rather than consistent rewarding of behavior. This further explains the need to belong when interacting with other people who increasingly validate our experiences in life. Technology in recent years has made this process even more accessible for all deaf individuals in terms of connecting with other like individuals outside of the physical meeting space. Text messaging, instant messaging, online chat rooms, and video chatting are but a few examples of how deaf individuals connect with each other. This, far more easily than previously, lends one to connect with other like-minded individuals.

Current literature strongly suggests that people are drawn to each other because of similarity in personality and the intensity of friendships formed.[51] Maarten Selfhout and colleagues conducted a study exploring the development of friendship and the way similarity in personality influences the intensity of the friendship.[52] Results indicated that not only was perceived similarity a factor in developing a friendship but also the number of times friends communicated with each other was a critical component in maintaining friendships. This further supports research illustrating how important both perceived similarity and communication components are in developing social relationships.[53] Clearly, both

physical proximity and technology access are critical factors in facilitating this process. Interestingly, a study by Azy Barak and Yael Sadovsky illustrates how the Internet may be empowering for not only hearing but also deaf users. Based on a sample of 114 "hearing impaired" and 100 hearing users in Israel, Barak and Sadovsky found that hearing-impaired "high users" of the Internet were similar in well-being (as measured by loneliness and self-esteem) to hearing users, whereas those using the Internet less were lower in well-being.[54]

Effective communication in close relationships is characterized by several features beyond shared language: strong and lasting friendships are better served by direct and open communication of feelings rather than choosing words that may be perceived as too carefully phrased by the individual.[55] A need to affiliate starts individuals' drive to seek others who are like themselves, who are perceived as similar in personality and likely to give support to others, and a healthy sense of self-efficacy goes a long way in building long-lasting friendships regardless of cultural status.

In addition to the components of perceived similarity and communication, perceived support has also been suggested as a critical component for social relationships. Barbara Sarason and colleagues found that "perceived support . . . is predictive of coping effectiveness, adjustment outcome, and psychological and physical well-being."[56] This indicates that if an individual feels she will receive support from other like-minded individuals, she will maintain a healthy outlook. It stands to reason that a deaf spoken-language user will typically seek out other oral deaf individuals for potential support because of shared experiences and similar worldviews.[57] Having a large group of friends has been an important factor in the development of social friendships with people with an oral-education background, but more important is that shared sense of "soul-mate" support and a way to share common experiences for mutual benefit.[58] Most of the individual stories of oral deaf lives that Jim Reisler reports indicate the value of oral deaf people getting together and feeling gains of affinity that make them feel special and supported, in turn reinforcing their sense of self as deaf persons.[59] For example, in a study by Irene Leigh of deaf and hard-of-hearing members of the Alexander Graham Bell Association for the Deaf and Hard of Hearing, participants said that they no longer saw themselves as being "alone" after having the opportunity to interact with like-minded peers who had had similar experiences of what it means to be deaf in a hearing society.[60] As one of the stories in Reisler's book *Voices of the Oral Deaf* indicates, getting together with like-minded peers at biennial conferences has been a personal renewal.[61] Two of the authors of this chapter have also observed that lifelong campers at Cued Speech camps, which are held annually in various locations in the United States, often become camp counselors, because this is a way for them to connect with others who also use Cued Speech as a primary form of communication; in this way, they feel themselves enriched. Overall, it stands to reason that individuals who have formed an opinion of perceived similarity to oth-

ers, a communication style used mutually with others, and a sense of support will gain a healthy sense of self-efficacy.

Belonging to a network of like-minded individuals with similar backgrounds helps to enhance resilience. Although initially it would seem that being identified as deaf is a risk factor for difficulties in life, there is documentation of how resilience can be enhanced and reinforced in deaf children through positive environmental factors.[62] These environmental factors include all of the components referred to earlier, specifically attachment and bonding, communication, and appropriate social support. Given optimal environments, these individuals have the potential to benefit from being deaf through unique attention and support that they might not otherwise have received. The internalization of resilience helps them withstand and problem-solve situations related to limited or lacking communication access, exclusion from interactions with hearing peers, and experiences of discrimination. In this way, Deaf Gain is also manifested.

Conclusion

The main premise of this chapter is that, in more ways than one, there are gains to being deaf. We have explored this notion through the lens of possibilities apart from the reliance on signed languages for enhancing visual relationships with one's world. We have presented research on the ways that nonsigning deaf individuals benefit from their use of vision to enhance their communication with their worlds. We have presented a brief review of relational aspects based on social psychology that support the unique gains deaf people have in relating with each other and taking pride in each other's company. The existence of this Deaf Gain is exemplified by Kristin Buehl, an oral deaf adult, who writes, "My deafness has been a gift. If it had not been for my deafness, I would be a different person today and I wouldn't want to change myself for anything in the world."[63] We hope that readers come away with a sense of how being deaf can result in deaf-related gains that create fruitful, fulfilling lives.

Notes

1. John Harris, *Enhancing Evolution: The Ethical Case for Making Better People* (Princeton, N.J.: Princeton University Press, 2010).
2. Christopher Krentz, "Frankenstein, Gattaca, and the Quest for Perfection," in *Genetics, Disability, and Deafness,* ed. John V. van Cleve (Washington, D.C.: Gallaudet University Press), 189–201; Michael Sandel, *The Case against Perfection: Ethics in the Age of Genetic Engineering* (Cambridge, Mass.: Harvard University Press, 2007).
3. Lennard Davis, *Enforcing Normalcy: Disability, Deafness, and the Body* (London: Verso, 1995).
4. Jan Branson and Don Miller, *Damned for Their Difference: The Cultural Construction of Deaf People as Disabled* (Washington, D.C.: Gallaudet University Press, 2002).
5. Susan Burch, *Signs of Resistance: American Deaf Cultural History, 1900 to World War II* (New York: New York University Press, 2002).
6. Marc Marschark and Patricia Elizabeth Spencer, eds., *Oxford Handbook of Deaf Studies,*

Language, and Education, vol. 2 (New York: Oxford University Press, 2010); Marc Marschark and Patricia Elizabeth Spencer, eds., *Oxford Handbook of Deaf Studies, Language, and Education*, vol. 1 (New York: Oxford University Press, 2011).

7. David Luterman, "Ten Considerations for Early Intervention Derived from Fifty Years in the Clinic," *Hearing Journal* 61, no. 5 (2008): 25–28; Marc Marschark et al., "Will Cochlear Implants Close the Reading Achievement Gap for Deaf Students?," in Marschark and Spencer, *Oxford Handbook of Deaf Studies, Language, and Education*, 2:127–43; Marc Marschark and Patricia Elizabeth Spencer, "Paradigm Shifts, Difficult Truths, and an Increasing Knowledge Base in Deaf Education," in Marschark and Spencer, *Oxford Handbook of Deaf Studies, Language, and Education*, 2:473–78; Anneke M. Vermeulen et al., "Reading Comprehension of Deaf Children with Cochlear Implants," *Journal of Deaf Studies and Deaf Education* 12, no. 3 (2007): 283–302.
8. Mary K. Fagan et al., "Neuropsychological Correlates of Vocabulary, Reading, and Working Memory in Deaf Children with Cochlear Implants," *Journal of Deaf Studies and Deaf Education* 12 (2007): 461–71; Ann E. Geers, "Spoken Language in Children with Cochlear Implants," in *Advances in the Spoken Language Development of Deaf and Hard-of-Hearing Children*, ed. Patricia Elizabeth Spencer and Marc Marschark (New York: Oxford University Press, 2006), 244–70; Marschark et al., "Will Cochlear Implants Close the Reading Achievement Gap for Deaf Students?"
9. Shirin D. Antia, Kathryn H. Kreimeyer, and Susanne Reed, "Supporting Students in General Education Classrooms," in Marschark and Spencer, *Oxford Handbook of Deaf Studies, Language, and Education*, 2:72–92.
10. H-Dirksen L. Bauman and Joseph Murray, "Deaf Studies in the Twenty-First Century: 'Deaf-Gain' and the Future of Human Diversity," in Marschark and Spencer, *Oxford Handbook of Deaf Studies, Language, and Education*, 2:216.
11. H-Dirksen L. Bauman and Joseph J. Murray, Introduction to this volume.
12. Bauman and Murray, "Deaf Studies in the Twenty-First Century."
13. Joseph Michael Valente, Benjamin Bahan, and H-Dirksen L. Bauman, "Sensory Politics and the Cochlear Implant Debates," in *Cochlear Implants: Evolving Perspectives*, ed. Raylene Paludneviciene and Irene W. Leigh (Washington, D.C.: Gallaudet University Press, 2011), 245–58.
14. Bauman and Murray, "Deaf Studies in the Twenty-First Century," 216.
15. Valente, Bahan, and Bauman, "Sensory Politics and the Cochlear Implant Debates."
16. Hansel Bauman, "Gallaudet DeafSpace design, V. 1," unpublished manuscript.
17. John Pleis and Richard Coles, "Summary Health Statistics for U.S. Adults: National Health Interview Survey, 1998," in *Vital Health Statistics*, vol. 10 (Washington, D.C.: National Center for Health Statistics, 2002), 209.
18. Bonnie B. Blanchfield, Jacob J. Feldman, and Jennifer L. Dunbar, "The Severely to Profoundly Hearing-Impaired Population in the United States: Prevalence Estimates and Demographics," *Journal of the American Academy of Audiology* 12 (2001): 183–89.
19. Ross E. Mitchell et al., "How Many People Use ASL in the United States? Why Estimates Need Updating," *Sign Language Studies* 6, no. 3 (2006): 306–35.
20. Irene W. Leigh, *A Lens on Deaf Identities* (New York: Oxford University Press, 2009); Jane Fernandes and Shirley Myers, "Inclusive Deaf Studies: Barriers and Pathways," *Journal of Deaf Studies and Deaf Education* 15, no. 1 (2010): 17–29; Irene W. Leigh, *Psychotherapy with Deaf Clients from Diverse Groups* (Washington, D.C.: Gallaudet University Press, 2010).
21. Lisa Bain, Sam Scott, and Annie G. Steinberg, "Socialization Experiences and Coping Strategies of Adults Raised Using Spoken Language," *Journal of Deaf Studies and Deaf Education* 9 (2004): 120–28; Neil S. Glickman, "The Development of Culturally Deaf Identities," in *Culturally Affirmative Psychotherapy with Deaf Persons*, ed. Neil S. Glickman and Michael A. Harvey (Mahwah, N.J.: Erlbaum, 1996), 115–53.

22. Irene W. Leigh, "Inclusive Education and Personal Development," *Journal of Deaf Studies and Deaf Education* 4 (1999): 236–45; Gina A. Oliva, *Alone in the Mainstream* (Washington, D.C.: Gallaudet University Press, 2004).
23. Leigh, *A Lens on Deaf Identities;* Paludneviciene and Leigh, *Cochlear Implants.*
24. Christine Yoshinaga-Itano, "Early Identification, Communication Modality, and the Development of Speech and Spoken Language Skills: Patterns and Considerations," in Spencer and Marschark, *Advances in the Spoken Language Development of Deaf and Hard-of-Hearing Children,* 298–327.
25. Johan Lundstrom, cited in Kirsten Weir, "Scents and Sensibility," *Monitor on Psychology* 42, no. 2 (2011): 41–44.
26. Donna Morere, "Bimodal Processing of Language for Cochlear Implant Users," in Paludneviciene and Leigh, *Cochlear Implants.*
27. Lucia M. Vaina et al., "Functional Neuroanatomy of Biological Motion Perception in Humans," *Proceedings of the National Academy of Sciences* 98, no. 20 (2001): 11656–61.
28. Ruth Campbell, Mairéad MacSweeney, and Dafyyd Waters, "Sign Language and the Brain: A Review," *Journal of Deaf Studies and Deaf Education* 13, no. 1 (2008): 3–20; Deborah A. Hall, Clayton Fussell, and A. Quentin Summerfield, "Reading Fluent Speech from Talking Faces: Typical Brain Networks and Individual Differences," *Journal of Cognitive Neuroscience* 17 (2005): 939–53; Daniel S. Kislyuk, Riika Möttönen, and Mikko Sams, "Visual Processing Affects the Neural Basis of Auditory Discrimination," *Journal of Cognitive Neuroscience* 20, no. 12 (2008): 2175–84; Riikka Möttönen, Martin Schürmann, and Mikko Sams, "Time Course of Multisensory Interactions during Audiovisual Speech Perception in Humans: A Magnetoencephalographic Study," *Neuroscience Letters* 363 (2004): 112–15.
29. Monica Zilbovicius et al., "Autism, the Superior Temporal Sulcus, and Social Perception," *Trends in Neurosciences* 29, no. 7 (2006): 359–66, doi:10.1016/j.tins.2006.06.004.
30. Daphne Bavelier, Matthew W. G. Dye, and Peter C. Hauser, "Do Deaf Individuals See Better?," *Trends in Cognitive Neuroscience* 10, no. 11 (2006): 512–18.
31. Allegra Cattani, John Clibbens, and Timothy J. Perfect, "Visual Memory for Shapes in Deaf Signers and Nonsigners and in Hearing Signers and Nonsigners: Atypical Lateralization and Enhancement," *Neuropsychology* 21, no. 1 (2007): 114–21.
32. Morere, "Bimodal Processing of Language for Cochlear Implant Users"; Lynn Woodhouse, Louise Hickson, and Barbara Dodd, "Review of Visual Speech Perception by Hearing and Hearing-Impaired People: Clinical Implications," *International Journal of Language and Communication Disorders* 44, no. 3 (2009): 253–70.
33. Edward T. Auer and Lynne E. Bernstein, "Enhanced Visual Speech Perception in Individuals with Early-Onset Hearing Impairment," *Journal of Speech, Language, and Hearing Research* 50, no. 5 (2007): 1157–65.
34. Tara Mohammed et al., "Speechreading Skill and Visual Movement Sensitivity Are Related in Deaf Speechreaders," *Perception* 34 (2005): 205–16.
35. Morere, "Bimodal Processing of Language for Cochlear Implant Users."
36. Möttönen, Schürmann, and Sams, "Time Course of Multisensory Interactions during Audiovisual Speech Perception in Humans."
37. Morere, "Bimodal Processing of Language for Cochlear Implant Users."
38. Virginie van Wassenhove, Ken W. Grant, and David Poeppel, "Visual Speech Speeds Up the Neural Processing of Auditory Speech," *Proceedings of the National Academy of Sciences* 102, no. 4 (2005): 1181–86.
39. Carl A. Binnie, Allen A. Montgomery, and Pamela L. Jackson, "Auditory and Visual Contributions to the Perception of Consonants," *Journal of Speech and Hearing Research* 1, no. 17 (1974): 619–30; Barbara Dodd, "The Role of Vision in the Perception of Speech," *Perception* 6, no. 1 (1977): 31–40.
40. Sheetal Desai, Ginger Stickney, and Fan-Gang Zeng, "Auditory-Visual Speech Perception

in Normal-Hearing and Cochlear-Implant Listeners," *Journal of the Acoustical Society of America* 123, no. 1 (2008): 428–40.

41. Cheryl M. Capek et al., "Cortical Circuits for Silent Speechreading in Deaf and Hearing People," *Neuropsychologia* 46, no. 5 (2008): 1233–41.
42. Tonya R. Bergeson, David B. Pisoni, and Rebecca A. O. Davis, "Development of Audiovisual Comprehension Skills in Prelingually Deaf Children with Cochlear Implants," *Ear and Hearing* 26, no. 2 (2005): 149–64.
43. Matthew W. G. Dye, Peter C. Hauser, and Daphne Bavelier, "Is Visual Selective Attention in Deaf Individuals Enhanced or Deficient? The Case of the Useful Field of View," *PLoS One* 4, no. 5 (2009): e5640.
44. Leigh, *A Lens on Deaf Identities.*
45. Bonnie Bhatti, David S., Seung-Ock Kim, and Harry Specht, "The Association between Child Maltreatment and Self-Esteem," in *The Social Importance of Self-Esteem*, ed. Andrew M. Mecca, Neil J. Smelser, and John Vasconcellos (Berkeley: University of California Press, 1989); Louise C. Hawkley et al., "Loneliness in Everyday Life: Cardiovascular Activity, Psychosocial Context, and Health Behaviors," *Journal of Personality and Social Psychology* 85 (2003): 105–20.
46. Leigh, "Inclusive Education and Personal Development."
47. Jim Reisler, *Voices of the Oral Deaf* (Jefferson, N.C.: McFarland, 2002).
48. See Inge Bretherton, "The Origins of Attachment Theory: John Bowlby and Mary Ainsworth," *Developmental Psychology* 28 (1992): 759–75, for a complete history of the development of attachment.
49. Mary S. Ainsworth, "Attachments beyond Infancy," *American Psychologist* 44, no. 4 (1989): 709–16.
50. Elliot Aronson, *The Social Animal* (New York: Worth, 2007).
51. Donn Byrne and Don Nelson, "Attraction as a Linear Function of Proportion of Positive Reinforcements," *Journal of Personality and Social Psychology* 1, no. 6 (1965): 659–63; Rick H. Hoyle, "Interpersonal Attraction in the Absence of Explicit Attitudinal Information," *Social Cognition* 11, no. 3 (1993): 309–20.
52. Maarten Selfhout et al., "In the Eye of the Beholder: Perceived, Actual, and Peer-Rated Similarity in Personality, Communication, and Friendship Intensity during the Acquaintanceship Process," *Journal of Personality and Social Psychology* 96, no. 6 (2009): 1152–65.
53. Howard Goldstein and Juliann J. Woods, "Promoting Communication Competence in Preschool Age Children," in *Interventions for Academic and Behavior Problems II: Preventive and Remedial Approaches,* ed. Mark Shinn, Hill M. Walker, and Gary Stoner (Washington, D.C.: National Association of School Psychologists, 2002), 469–99; Efrosini Kalyva and Elias Avramidis, "Improving Communication between Children with Autism and Their Peers through the 'Circle of Friends,'" *Journal of Applied Research in Intellectual Disabilities* 18, no. 3 (2005): 253–61; Joy Koesten, "Family Communication Patterns, Sex of Subject, and Communication Competence," *Communication Monographs* 71, no. 2 (2004): 226–44.
54. Azy Barak and Yael Sadovsky, "Internet Use and Personal Empowerment of Hearing-Impaired Students," *Computers in Human Behavior* 24, no. 5 (2008): 1802–15.
55. Aronson, *The Social Animal.*
56. Barbara R. Sarason et al., "Perceived Social Support and Working Models of Self and Actual Others," *Journal of Personality and Social Psychology* 60, no. 2 (1991): 273–87.
57. Leigh, *A Lens on Deaf Identities;* Oliva, *Alone in the Mainstream;* Reisler, *Voices of the Oral Deaf.*
58. Oliva, *Alone in the Mainstream;* Reisler, *Voices of the Oral Deaf.*
59. Reisler, *Voices of the Oral Deaf.*
60. Leigh, "Inclusive Education and Personal Development."

61. Reisler, *Voices of the Oral Deaf.*
62. Alice Eriks-Brophy et al., "Facilitators and Barriers to the Inclusion of Orally Educated Children and Youth with Hearing Loss in Schools Promoting Partnerships to Support Inclusion," *Volta Review* 106, no. 1 (2006): 53–88; Deborah H. Zand and Katherine J. Pierce, *Resilience in Deaf Children: Adaptation through Emerging Adulthood* (New York: Springer, 2011).
63. Kristin Buehl, quoted in Reisler, *Voices of the Oral Deaf.*

VI

CREATIVE **GAINS**

22

DEAFSPACE
An Architecture toward a More Livable and Sustainable World

HANSEL BAUMAN

> Taking possession of space is the first gesture of
> living things, of men and animals, of plants and clouds,
> a fundamental manifestation of equilibrium and duration.
> The occupation of space is the first proof of existence.
> —*Lisa Findley, Architecture, Politics, and Cultural Agency*

The desire to take possession of space is deeply embedded in Deaf culture. Throughout history Deaf people have "developed this desire to form their own commonwealth where they would be in control of their lives—politically, economically and educationally."[1] The vision of a Deaf state proposed by John Flournoy in 1850 and the more recently proposed new town Laurent, South Dakota, designed specifically for sign-language users, are just two examples of the often-expressed phrase "in search of a place of our own." Yet although Deaf people's appreciation of place may be profound, it is not particularly comfortable. According to Carol Padden, "There are very few 'places' Deaf people can call their own. For most of their history in the United States they have occupied spaces built by others and largely controlled by others."[2] Deaf schools, many designed on the model of an asylum, are a notable example of spaces occupied by but not owned or operated by deaf people that has left its mark on their spatial psyche. Arguably, within this lack of having a place lie the origins and forces that sustain deaf people's search for a place in which they may have a natural sense of identification and orientation—the two basic aspects of dwelling.[3]

"A place of our own" is, in a sense, a mantra of Deaf culture that sustains collective and conscious awareness of our basic human existence; as Christian Norberg-Schulz says in his landmark work *The Concept of Dwelling*, it is an "insoluble unity of life and place."[4] The search for a Deaf space looks to create a place to dwell rather than a place to use: "To dwell implies the establishment of a meaningful relationship between 'man' and a given environment."[5] In a more active sense, "[d]welling is an exchange and fusion; as I settle in a space, the space settles in me and it turns into an ingredient of my sense of self."[6] Because the act of dwelling is so deeply ingrained, Deaf people have created Deaf places such as Deaf residential

schools, Deaf clubs, and Deaf homes in spite of scarce ownership. No matter how ephemeral, "[t]hese places would serve as liberators of their language and cultural functions."[7]

As this chapter will explore in greater depth, the experience and making of architecture are fundamental to human existence. Beyond shelter, architecture establishes presence and holds and transmits meaning. Cultural identity and power are associated with architecture, and our individual and collective sense of well-being is, in many ways, defined by the spaces we inhabit. Through the making of architecture, we are *connected* to our world. In 1941, Winston Churchill succinctly characterized the reciprocity between human experience and architecture in his famous quote: "We shape our buildings, and afterwards our buildings shape us."[8]

Historically, the potential for architecture as a means of cultural expression for the deaf community has gone unrecognized. Yet many deaf people possess an acute architectural awareness and a sensitivity to the connection between personhood and the spaces they inhabit. These aptitudes, honed by daily experiences of isolation and physical barriers to communication and orientation, form a unique sensibility that stands to enhance the way architecture is conceived and constructed for deaf people and society at large. This is Deaf Gain for architecture.

Over the course of history, humankind's connection to the physical world has moved from the primitive act of *dwelling,* in contact with every aspect of the environment, to our modern industrialized *habitation,* disconnected from basic forces of our natural ecosystems. Modernity "separates mind and body, body and space."[9] Modern settlements in the developed world today have evolved from the essential split between mind, body, and place that has been embedded in Western culture since Plato declared reason to be the supreme faculty distinguishing human from beast. Plato proposed that social hierarchy mirrors sensory hierarchy, with vision (philosophers) at the top, and touch (artisans and farmers) ranking at the low end, just above slaves, in the ideal Republic. Descartes, writing in the seventeenth century, mistrusted the senses. Sarah Robinson writes that, for Descartes, "sensory information contaminated pure certainty of mind and locus of reason."[10]

Because of the pressures of climate change, dwindling resources, the alienating effects of technology, and the banality of much of our built environment, there is an imperative to swing this modern paradigm back toward a deep, more primitive connection with our physical surroundings and with one another. The now-pervasive sustainability or "green" movement, universal design, and healthy food movements are evidence of a collective desire to reconnect human experience with physical place. Deaf experiences offer a unique insight about disconnection and connection with others and with the physical environment that parallels—and in many ways foreshadows—society's broader cycle of a lack and a desire for connection.

Throughout history, Deaf people have developed an exceedingly practical and elegant means of adapting their surroundings to reflect their unique ways of being, often referred to as DeafSpace. Inherent within Deaf experiences reside an architectural wisdom and a drive to create, or to dwell, within places that are expressive of Deaf people's ways of being. This motivation goes beyond adapting environments for accessibility to (re-)creating a new *vernacular* architectural sensibility that stands to redefine the way our society will build a more sustainable and livable world. This is Deaf Gain for society.

This chapter chronicles the emerging DeafSpace concept and proposes a means for placing DeafSpace within contemporary architectural discourse and building practices to access lessons Deaf people may contribute to building a more sustainable and livable world. The DeafSpace concept and its origins are broadly defined in terms of daily acts of cultural customization focused toward building connection—visual, spatial, social, and symbolic. Further, I explore the problem of defining DeafSpace within architectural discourse to provide a framework for linking deaf sensibilities and their architectural manifestations. Rather than conceiving DeafSpace in traditional stylistic terms or in the category of universal design, I present DeafSpace as an architectural pattern language comprising basic design elements and a syntax, or a way of building inspired by Deaf collectivist social sensibilities. I describe basic design elements of DeafSpace as they were developed through research at Gallaudet University. I then explore lessons on the design and construction process for making architecture within the DeafSpace idiom through two case-study building projects constructed on the Gallaudet campus. From these case studies a vernacular architectural sensibility emerges. The process and aesthetic tendencies described constitute a new vernacular architecture of connection. Finally, the chapter concludes with an exploration of current societal desire for a deeper connection between sensory experience, the body, and space and of how the wisdom and drive of Deaf people to create a place of their own redefine the ways architects, builders, and indeed, all of us work together to construct a more sustainable and livable world.

This chapter is written not from the deaf perspective but rather from my view as an architect—a hearing architect—who has enjoyed the privilege of working with members of the deaf community since 2005. The real authors of this work, however, are the more than fifty deaf individuals who have shared their life stories and architectural insights through the DeafSpace Project at Gallaudet University's ASL and Deaf Studies Department. The contributions of these individuals have made it possible to codify the DeafSpace idea as a set of design guidelines—a profound first step toward the making of a new architecture. The collective wisdom of DeafSpace reported in this chapter is deepened and made accessible through the work of Ben Bahan and H-Dirksen Bauman and, more recently, the visionary research and design work by Robert Sirvage. The scope of their work, among others', has had an influence well beyond the campus and even beyond the domain of

architecture. This chapter, written from a practitioner's perspective, is a glimpse into what we have learned so far and a deliberation on what the architectural profession has to gain from DeafSpace.

Cultural Customization and the Origins of DeafSpace

Deaf people inhabit a rich sensory world in which lies the seed of a profound approach to experiencing our built environment and shaping the foundational aspects of architecture: form, space, light, and material. At its most basic level, DeafSpace grows from the simple fact that, for Deaf people, vision and touch are a primary means of spatial awareness and orientation. Many use sign language, a visual-kinetic mode of communication, and maintain a strong cultural identity built around these sensibilities and shared life experiences.

Our built environment, largely constructed by and for hearing individuals, presents a variety of surprising challenges for Deaf people. In response to these obstacles, Deaf people have responded with a particular way of altering their surroundings to fit their unique ways of being. The slow drip of constantly navigating barriers has the ironic effect of undermining one's sense of identity and well-being while necessitating a more acute awareness of the built environment.

For some, overcoming barriers initiates creative action to alter the surroundings to fit their unique needs and identities. Such resourceful acts, no matter how small, point to a dialogue between individuals and the physical environment that is at the core of our humanity: the innate desire to dwell—in other words, to create a place where one feels at home, a place one knows and identifies with—where one feels secure and easily oriented.

In his 2009 analysis of the Deaf home, Matthew Malzkuhn refers to this process as "cultural customization." Malzkuhn's research documents strategies of customization Deaf homeowners have used in existing homes they have purchased and/or new ones they have built for themselves. The most common themes include the making of a common collective space; the taking down of interior walls or making new openings between rooms; and the placement of mirrors and lights in strategic locations to extend sensory awareness and maintain visual connection between family members and guests.[11] These practical acts of customization are commonly recognized traditions within Deaf culture. In his article "Memoir upon the Formation of a Visual Variety of the Human Race," Ben Bahan describes how "signers naturally create or modify their habitat as exemplified by the notorious phrase 'this is a deaf house.' This comment indicates that a particular house has earned the 'seal of approval' for the way it is structured for vision."[12]

In architectural terms, commonly recognized acts of cultural customization like those Bahan cites are examples of an architectural pattern that, according to Churchill, "consist[s] of the physical and social relationships that arise as solutions to problems that occur over and over again in our environment."[13] DeafSpace ar-

chitectural patterns are constructed when deaf people modify their environment to fit their linguistic, cognitive, and social sensibilities. Given the unique sensory and spatial dimensions of these fundamental aspects of deaf experience, they hold intrinsic architectural implications that make them the origins of DeafSpace.

Forming built space around visual language and deaf sensory abilities, the practical and experiential aspects of architecture are constructed in ways that express Deaf culture. If built completely, DeafSpace architectural patterns translate into what may be referred to as Deaf architecture—a complete work that goes beyond adapting buildings to meet the needs of deaf people to creating an aesthetic and meaning that emerge out of the ways deaf people inhabit and construct their spaces.

Placing DeafSpace in Architectural Discourse

DeafSpace, or Deaf architecture, has not been recognized within popular architectural discourse. Indeed, there are socioeconomic reasons for this that go beyond the scope of this chapter. Nevertheless, it is critical to recognize the potential of codifying DeafSpace in architectural terms as a way to shift attention toward the need for, and benefit of, an architecture that embodies deaf experiences.

Customarily, architectural discourse categorizes works in terms of particular physical place, time, and socioeconomic groups. Deaf people and their modest and often ephemeral architecture are dispersed across all these categories, making it difficult to define DeafSpace in the traditional terms. Perhaps, then, DeafSpace is better categorized within the discourse of universal design. As I will discuss later, this, too, is problematic, for a number of reasons. In architectural terms, one of the distinguishing aspects of DeafSpace is that it does not seek universal solutions but rather seeks to create particular sociospatial situations that more sensitively connect individuals to others and to their surroundings in a meaningful way regardless of where they are. What is needed is an alternative conceptual framework from outside the mainstream of architectural discourse. Christopher Alexander's seminal works *A Pattern Language* (1977) and *The Timeless Way of Building* (1979) provide an ideal model for categorizing an architecture focused on building connections between space, body, and meaning.[14]

Building within a pattern language provides a framework for assembling a coherent work of architecture from basic architectural patterns in accordance with a set of guiding principles. In Alexander's model, an architectural pattern presents a design problem and a solution in such a way that it can be customized to local conditions and cross-referenced in connection with a multitude of other patterns.[15] The assemblage of such patterns are guided by the principles of what Alexander refers to as the "timeless way of building," broadly defined as an organic way of building that resonates with the foundational concepts of DeafSpace. A Deaf-architectural pattern language establishes a beginning point from which a

coherent work of architecture can emerge that is responsive to and expressive of deaf sensibilities and that is uniquely attuned to the specific conditions of a building's function, location, cultural context, and economics.

The Emergence of DeafSpace as a Pattern Language

DeafSpace as a pattern language is an idea that has grown organically over time. Over the years, a number of design documents have provided Deaf people with ideas for ways to customize their homes and workplaces to address practical concerns about communication access.

The effort began to take on a new momentum in the spring of 2005, when a group of deaf scholars, students, and administrators gathered for the two-day DeafSpace Workshop at Gallaudet University (see Figure 22.1). The stated purpose of the workshop was to establish design principles for the new Sorenson Language and Communication Center (SLCC) to be constructed on the Gallaudet campus. The ideas put to paper in the workshop—building-design concepts (see Figure 22.2) and narratives of life stories—were transcribed into the document "A Case for SLCC Aesthetic Principles" to provide architects with more than sixty DeafSpace architectural patterns addressing space, light, composition, order, form, and materiality.

Workshop participants envisioned a place that reveals the sense of connection Deaf people feel among one another: a strong sense of community, a desire for openness and light, a feeling of well-being, and an awareness of nature as a constant reminder of the natural condition of deafness. These amount to a physical image of a place that expresses Deaf history and culture.[16]

Figure 22.1. A team of three workshop participants—Dirksen Bauman (*left*), Carl Pramuk (*standing*), and Jane Norman (*seated*)—present their DeafSpace concepts about materials to colleagues at the 2005 DeafSpace Workshop. Photograph courtesy of the author.

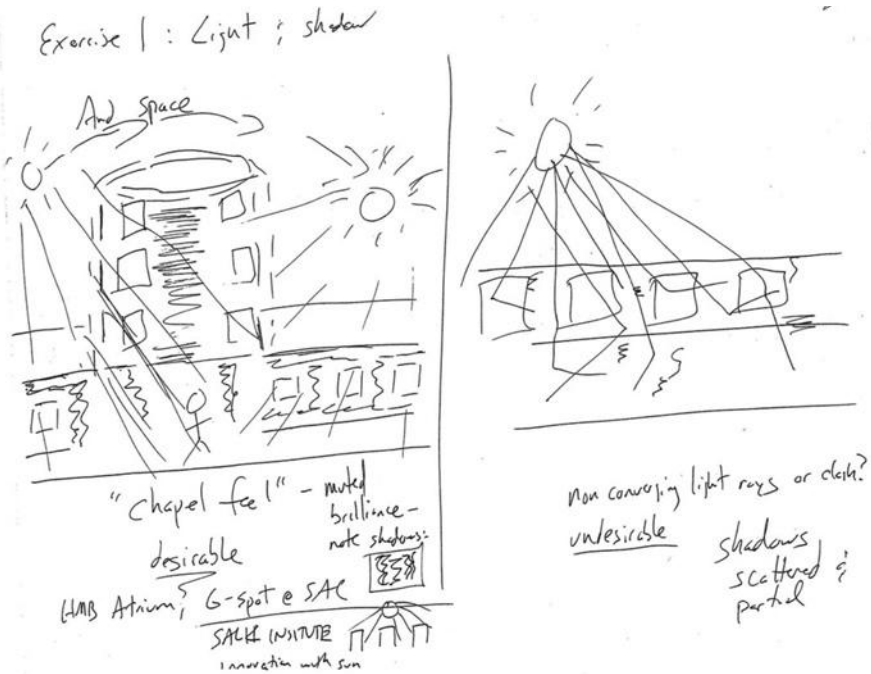


Figure 22.2. Sketches from the 2005 DeafSpace Workshop express a poetic view about deaf experiences and architecture. Sketches by Paul Dudis.

Through the DeafSpace Workshop, the participants intended to create something larger than the aesthetic principles for a single building. They wanted to concretize a collective wisdom about how to build in general, a wisdom that draws upon the sense of isolation Deaf people felt in the past in order to create places better attuned to their cognitive, linguistic, and cultural sensibilities. What this group started, in fact, is evolving into an architectural pattern language that expresses a deep awareness of, and sensitivity to, the dynamic connection between space, place, and human relationships.

Sensing the profound power of what was emerging from the two-day event, the DeafSpace Workshop participants coaxed the Gallaudet University administration into further exploration by establishing the DeafSpace Project in 2006, a special three-year design-and-research course offered through the ASL and Deaf Studies Department. During this time, students were guided through environmental-behavior research and architectural-design projects addressing actual design problems on or around the Gallaudet campus. Using the campus as a laboratory allowed for valuable real-time research to take place and for students to directly influence campus improvements and design projects.

The research and design activities of the DeafSpace Project have resulted in the synthesis of more than 150 Deaf-architectural patterns cataloged within the "Gallaudet DeafSpace Design Guide." These architectural patterns are

categorized according to their distinct relationship between deaf experiences and architecture: categories include space and proximity, sensory reach, light and color, and acoustics. Common to all of these categories are ideas of connection, community building, visual language, the promotion of personal safety, and well-being.

DeafSpace as a Vernacular Architectural Pattern Language

The ongoing research of the DeafSpace Project validates the formative role space plays in Deaf culture and individual experiences. Many of the Deaf participants described space by telling personal stories of isolation from and connection to place as well as to others, and often they used metaphors of spatial relationships between themselves and others to describe architectural concepts. This embodied, very personal awareness of space is a unique and enlightening way to think about architecture more empathetically.

The embodied spatial awareness so ingrained in Deaf experiences provides a framework for understanding the Deaf-architectural pattern language in terms of its linguistic, cognitive, and cultural origins. Cultural archetypes are used to describe the ways in which Deaf linguistic and cognitive sensibilities result in a set of measurable architectural patterns and the ways in which Deaf culture inspires a collective way of building and imbues architecture with immeasurable meaning and expression of Deaf identity.

Linguistic Sensibilities and Their Architectural Patterns

Sign language is a visual, spatial, and kinetic mode of communication that is architectural. The dynamics of clear communication between individuals or among a group, whether seated, standing, or walking together, inherently include spatial metrics based upon the need for sustained eye-to-eye communication that reset basic building-planning assumptions. Beyond mere function, spaces are configured in DeafSpace in terms of proxemics, the cultural, behavioral, and sociological aspects of spatial distances between individuals developed by anthropologist Edward T. Hall in 1966.

When Deaf people congregate, group members customarily work together to rearrange furnishings into a conversation circle to allow clear sightlines so everyone can participate in the visual conversation. This simple act of customization is a DeafSpace archetypal pattern used every day when Deaf people gather together for meals, social interactions, or formal affairs like meetings and lectures (see Figure 22.3).

The size and configuration of the conversation circle are dynamic and dependent upon the number of participants and the position taken by each individual to maintain a clear view of the signing range—defined as the space used by a signer to construct visual language—of all the others in the group. Combined, the signing range and the distance between signers that is needed to maintain visual con-

tact constitute a larger area than that required for oral communication (see Figure 22.4).[17]

Formal and informal gatherings manifest different patterns. Classrooms, for example, are designed with seating configured as a shallow arch facing the front of the classroom (the teaching wall) to direct focus primarily toward the instructor and secondarily toward classmates (see Figure 22.5). Visual classrooms, as a result, tend to be a rectangle wider in the direction parallel to the teaching wall, whereas the traditional, oralcentric plan tends to be deeper in the direction perpendicular to the lecture wall and seats about double the number that a visual classroom holds.[18]

Figure 22.3. This photograph from DeafSpace research on Deaf proxemics in 2008 documents the natural tendency for Deaf people to form a circle for visual access during a group conversation. Photograph by Julia Triman.

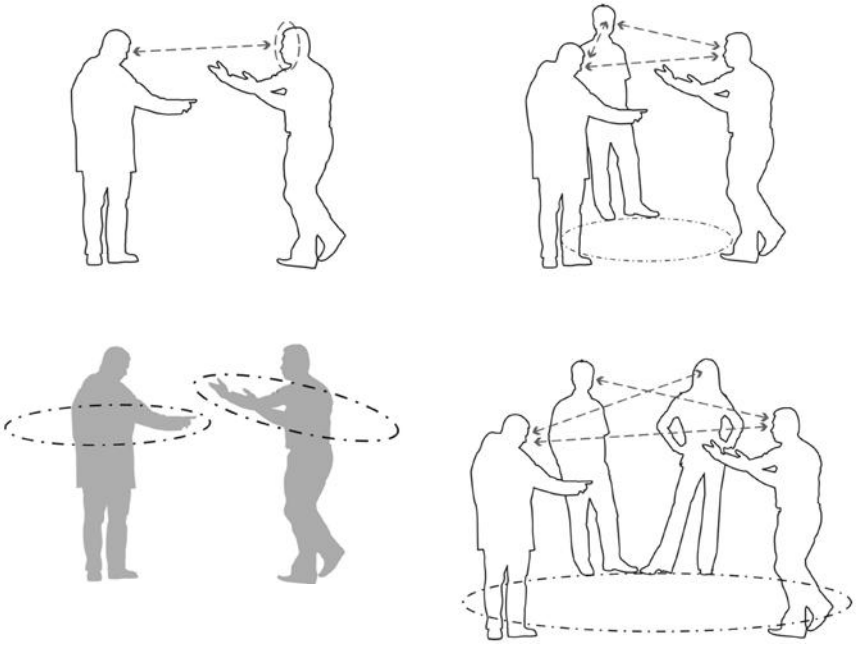


Figure 22.4. The space of the conversation circle is defined by the distance between signers and the signing range. The circle expands with each additional participant to provide visual access to everyone.

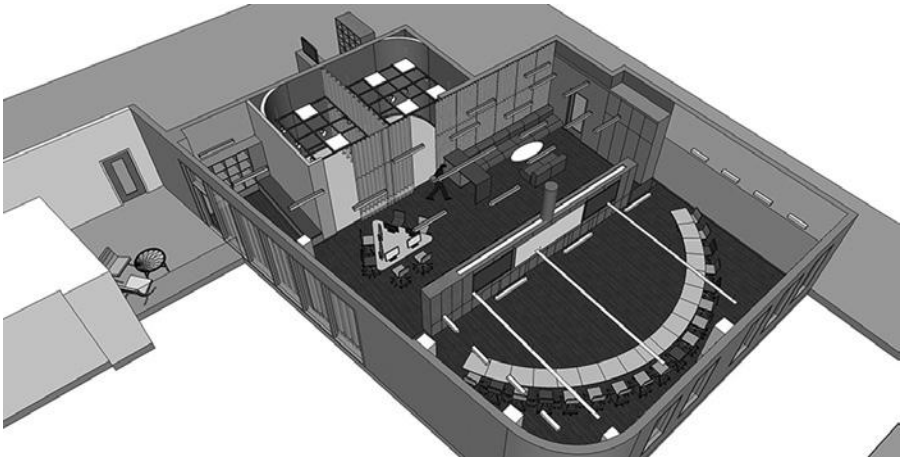


Figure 22.5. Perspective of a new classroom at Gallaudet University for the deaf studies department, designed by Dangermond Keane Architects. The room is designed around the visual classroom's shallow-arch seating arrangement.

The architectural implications of visual language extend beyond the confines of the conversation, as form, material, light, and color constitute the language's visual background. The making of a conversation circle often begins with participants adjusting window shades, lighting, and furnishings to optimize conditions for clear visual communication and to minimize eyestrain. Two DeafSpace patterns, "Layers of Light" and "Color: Contrasting Surface," are often used in combination to achieve the ideal ambient conditions of a "visually quiet" background for visual language.

Diffuse light, like that of a flat, cloudy sky, is ideal for seeing sign language. High-contrast conditions of glare, shadow patterns cast on the signer's face and signing range, and backlighting interrupt visual communication and can cause eye fatigue that leads to a loss of concentration and even physical exhaustion. Buildings in general, and especially gathering spaces, should be designed to provide multiple light sources to minimize the contrast between dark and light areas. Buildings can best provide layers of light using multiple sources of electric lighting and daylight for each room where possible. Windows and skylights are positioned to take in a variety of light intensities from multiple sides of the room and to wash building surfaces with light. Illuminated surfaces and multiple light sources polarize light and eliminate shadow, resulting in a calm, glowing space (see Figure 22.6).[19]

Reading of sign language is dependent upon visual clarity produced by the color contrast between the signer and his or her surroundings. Buildings in general, and gathering spaces in particular, should be contrasting and complementary

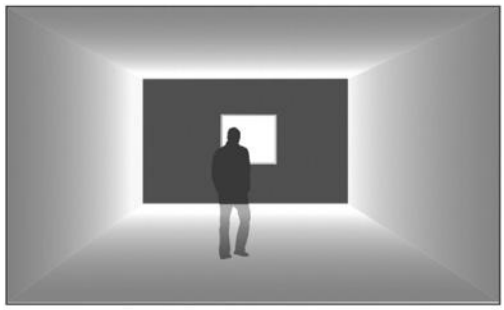
to the full range of human skin tones.[20] Cool colors within a range of blues and greens are recommended, especially for formal meeting rooms (see Figure 22.7).

Cognitive Sensibilities and Their Architectural Patterns

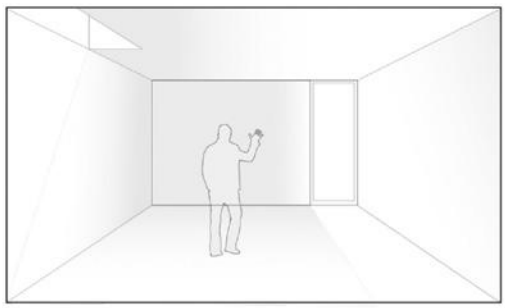
Spatial orientation, way finding, and the awareness of activities within our surroundings are essential to maintaining a sense of personal safety and well-being. Because deaf people do not sense through hearing activities that take place behind themselves, they innovate visual and tactile strategies to extend their sensory reaches to encompass a full 360-degree sensory field. Benjamin Bahan describes the sociospatial condition of sensory reach when he says, "There are different sets of learned behaviors and adaptive systems that are passed on with respect to 'reading the world.' One learns to engage in observing, looking and eventually seeing that sound has ways of bouncing off visual cues."[21]

Numerous DeafSpace patterns emerge from the multisensory ways that Deaf people read the activities and movement of others to maintain a sense of personal safety. Visual cues seen through openings to adjacent spaces, or subtle images seen in reflected surfaces or felt through structurally-borne vibrations, happen through the fundamental aspects of architecture—form, material, and light. The DeafSpace pattern "Soft Intersections" is a prime example of the way circulation spaces can be configured to extend sensory reach.

When Deaf people arrive at a corridor intersection, they do not sense the approach of those in the other corridor, resulting in the need for sudden movement to avoid collision



BAD



GOOD

Figure 22.6. The DeafSpace architectural pattern "Layers of Light" provides multiple sources of light, ideal for reading sign language, compared to the common single-source lighting condition of high contrast and backlighting.

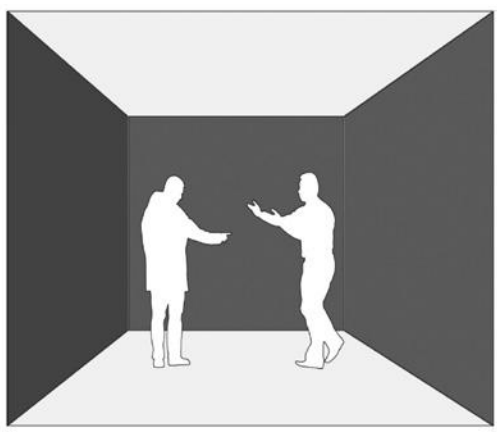


Figure 22.7. The DeafSpace architectural pattern "Color: Contrasting Surface" demonstrates how room surfaces with colors contrasting human skin tones enhance visual clarity for sign language.

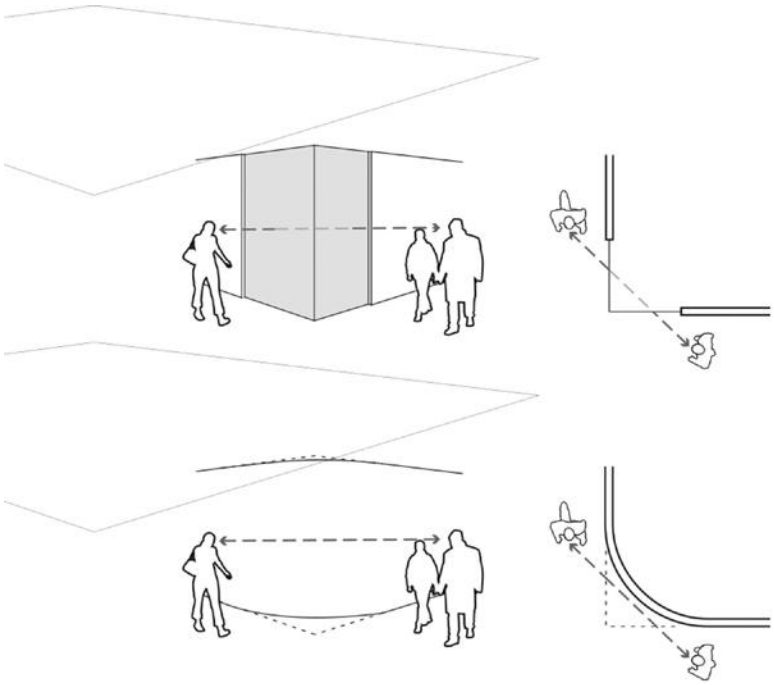


Figure 22.8. The DeafSpace architectural pattern "Soft Intersections" extends a person's sensory reach through the use of glass corners or radiused space at walkway intersections to heighten awareness of the approach of others.

with the oncoming individuals. "Soft Intersections" lowers the potential for startling collisions by providing glass corners or radiusing walls at corridor intersections to allow advanced visual warning of oncoming individuals (see Figure 22.8). The glass used in corners may be clear, or it may be obscured glass with enough opacity to detect movement.[22]

Other DeafSpace patterns create a visually legible environment as a fabric, weaving together visual cues about destinations, pathways, and the use of space seamlessly between outdoor and indoor environments. DeafSpace patterns of spatial legibility manifest the primacy of Deaf visual abilities and the innate desire to understand the conditions that lie just beyond one's immediate surroundings to ensure a sense of safety and well-being. As an example, two DeafSpace patterns, "Location of Building Entrances" and "Building Legibility," work in tandem to support spatial orientation seamlessly from large-scale urban space to buildings and ultimately to the more intimate space of a room. "Location of Building Entrances" points to the simple but often overlooked urban-design strategy of locating destination points within immediate view upon arrival in a central organizing outdoor space to enable a sense of direction (see Figure 22.9).[23]

Upon arrival at one's destination, the DeafSpace pattern "Building Legibility" allows for sensory reach beyond the exterior of a building by using architectural features to signify primary building uses before one enters the building. The early visual readability of a building helps visitors to anticipate the organization of spaces within it and to determine how they might find their way to their chosen destination (see Figure 22.10).[24]

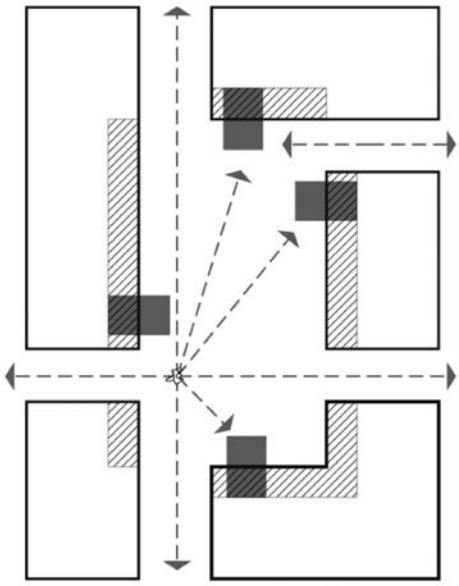


Figure 22.9. DeafSpace architectural pattern "Location of Building Entrances." In this conceptual diagram, the entrances to buildings organized around a central common outdoor space are indicated as rectangles. Because the entrances are oriented inward toward the central space, they are easily located upon arrival to the central space from any direction, providing an immediate sense of orientation. Diagram from the "Gallaudet DeafSpace Design Guide," Hansel Bauman, Architect.

Cultural Sensibilities and Their Architectural Patterns

Deaf culture is identified as a "collectivist culture." In her book *Reading between the Signs*, Anna Mindess describes it thus: "The American Deaf culture clearly qualifies as a collectivist culture with its emphasis on pooling resources, the duty to share information, the boundary between insiders and outsiders and loyalty to and strong identification with the group."[25] Malzkuhn describes the sociospatial relationship of the collectivist deaf culture this way: "When Deaf people are able to belong to place, whether it is theirs or not, they immediately feel connected to it and the people that occupy the space. This comes after a long history of being disconnected from families and

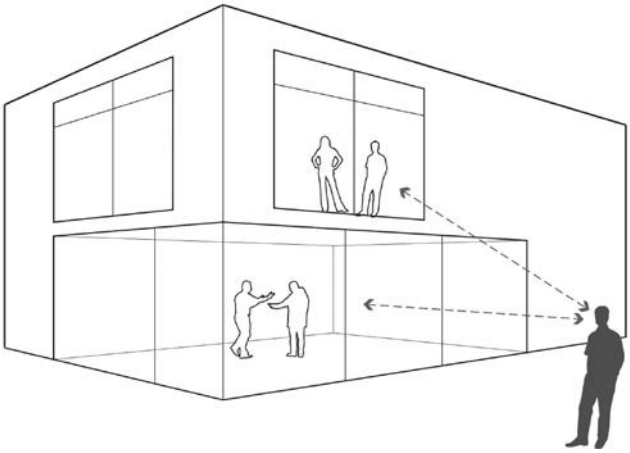


Figure 22.10. The DeafSpace architectural pattern "Building Legibility" strategically locates openings to reveal internal activities. These offer visual cues of the building's organization from outside to enhance way finding.

friends through physical, communicative and geographical differences. So in that sense, in customizing their space, it does not only allow them to feel connected to their environments and the world but it also allows them to have human connections which also confirm their existence."[26]

DeafSpace patterns emerge from Deaf culture's collectivist ways on a variety of scales that all bear resemblance to the fundamentals of the conversation circle: eye-to-eye communication and care for the well-being of others. On the building scale, the DeafSpace pattern "Connecting Interior Spaces" locates the building's principal uses around a communal space or spaces that occupants must pass through during their daily activities, thus encouraging casual interaction. Openings between the communal space(s) and the surrounding rooms are constructed to balance visual connection and privacy to sustain a sense of spatial and social connection (see Figure 22.11).

Deaf culture's emphasis on the shared responsibility to care for one another is transformed into architecture through the observed tendency Deaf people have to conceptualize spatial relationship in terms of the relationship one shares with others. In 2006, Benjamin Bahan and H-Dirksen Bauman described the role of architecture within Deaf culture in anthropomorphic terms: "architecture as the

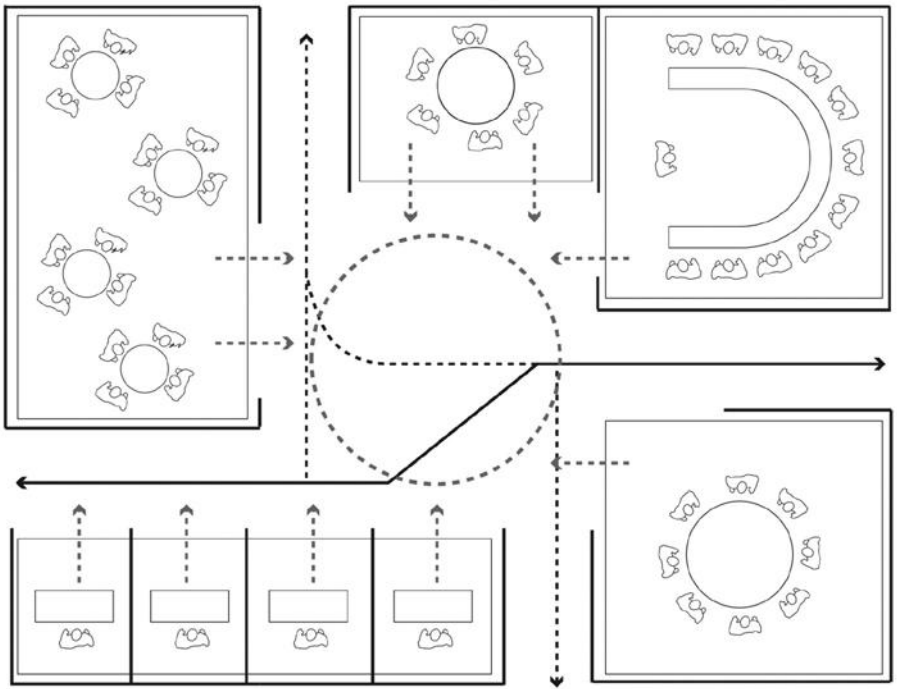


Figure 22.11. The DeafSpace architectural pattern "Connecting Interior Spaces" organizes building uses around a central collective space to foster visual connection and interaction among building occupants.

third person." The metaphor refers to the common experience a group of deaf people have when walking together as individuals take turns looking out for the group while engaging in a signed conversation. Just as the "third person" in the group focuses on the path forward and its possible hazards while others focus more intently on the conversation, buildings can *care* for their occupants by providing environmental cues that enhance spatial awareness, safety, and ambient conditions that promote well-being.[27]

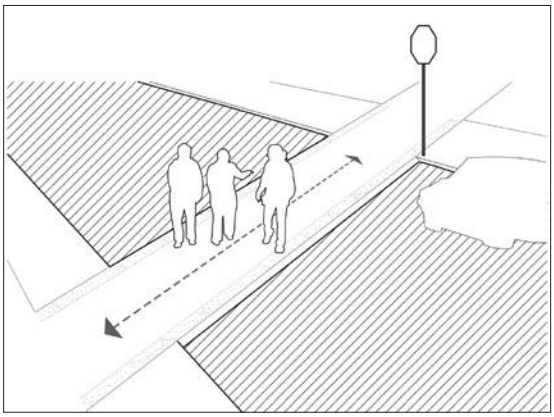


Figure 22.12. The DeafSpace architectural pattern "Deaf Walkway" provides a wide, unobstructed space for several groups of signers to comfortably pass one another while engaging in conversation. Textured edges provide a tactile warning to individuals nearing the edge of the safe walkway.

The metaphor "architecture as the third person" underscores many DeafSpace patterns that on their surface are about personal safety but that at a deeper level enable Deaf culture's force for social and spatial connection and care for one another. Like the archetypal pattern "Conversation Circle," the pattern "Deaf Walkway" acknowledges the wider proxemic dimensions between signers in comparison to those using oral languages. "Deaf Walkway" allows adequate space for groups of deaf people to pass while in a signed conversation without barriers such as bollards, light poles, signs, and other tripping hazards. The pattern also introduces the use of textured edges along each side of a walkway and at significant destination points or at potential hazards for tactile forewarning (see Figure 22.12). By reducing potential barriers and providing a clear, wide walkway, the built environment essentially takes on the task of the third person to keep the group of signers walking freely and safely as they focus on the signed conversation.[28]

DeafSpace patterns are also mindful of one's sense of privacy and need for solitude without disruption. When Deaf people occupy an enclosed space, it can be difficult for them to sense the approach of a visitor, so a deaf person may be startled when noticing a visitor's presence only after the visitor has arrived in the occupant's personal space. In order to mitigate sudden interruptions, Deaf people have devised ways to extend their sensory reach beyond their private space without compromising privacy.

The DeafSpace pattern "Sensory Threshold" creates a wall or zone between spaces that is designed to allow subtle cues of movement to pass between the spaces—in other words, to draw attention to the movement of others without startling interruption. Cues such as moving shadows may be seen through high windows, and subtle or obscured images of passersby may be seen through frosted

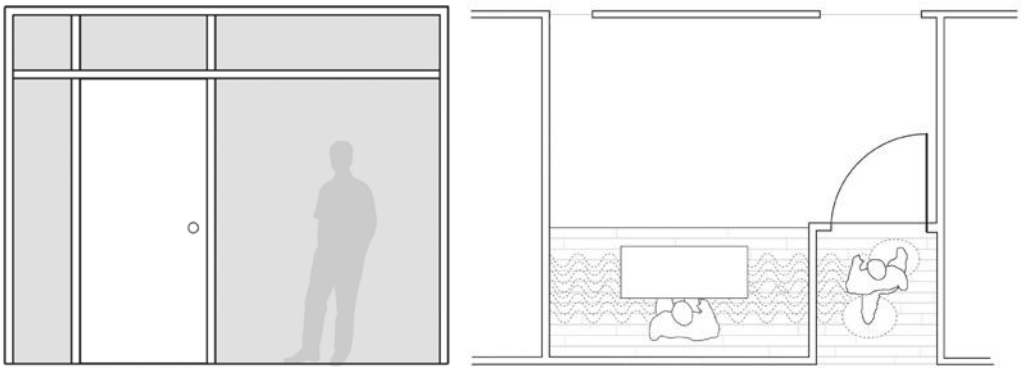


Figure 22.13. The DeafSpace architectural pattern "Sensory Threshold" reduces startling interruptions experienced by a room's occupant by enhancing visual and tactile means of detecting the movement of others. Obscured glass and wood floors that propagate vibration under a visitor's footfall are among these strategies.

glass. Rooms are accessed through alcoves placed over floor surfaces that propagate vibration into the space to cue the approach of a visitor (see Figure 22.13).[29]

We are now able to identify a syntax of the DeafSpace pattern language by reading the ways deaf people dwell. This is done daily through acts of cultural customization that mediate the dynamic physical conditions of a specific place with the dynamics of human spatial relationships in order to sustain meaningful connection to one another and to place. Working from observations made in the DeafSpace Project, the syntax proposed here may be summarized as the three ordering principles of "a collectivist way of building," "organic functionality," and "of a place." Taken together, these ordering principles create a mind-set for building measurable architectural patterns in such a way as to embody the immeasurable experience of dwelling that is fundamental to one's sense of well-being and identity.

Deaf culture's collectivist ways are realized in architecture through its collectivist way of building, as demonstrated through the daily ritual of constructing a conversation circle and the conceptualization of a building as the third person. When constructing a seated conversation circle, for example, participants often begin by asking each other where they prefer to position themselves relative to the space's physical barriers, ambient conditions, and one another. As the group settles, individuals often monitor room conditions on behalf of the others in the group. If necessary, an individual from the group automatically stands and moves to adjust lighting or other room conditions for the comfort of others.

The architecture of the conversation circle is dynamic, changing in size and configuration as individuals join or leave and as the topic and signers shift to give others a clear sight line or move in response to shifting ambient conditions. At any given moment, the conversation circle manifests an immediate, purpose-built

architecture that expresses the very particular physical relationships the conversation forges between its participants and the space they occupy. The intimate and dynamic spatial interactions of the conversation circle represent the DeafSpace pattern language's organic morphology, derived from the innate desire for sustained interpersonal and spatial connection.

Case Studies: Building the Deaf-Architectural Pattern Language

The precise scope and nature of the pattern language's three ordering principles are indeed a work in progress, and they are discussed in this chapter as they have been gleaned from the work of the DeafSpace Project. The two most recent building projects on the Gallaudet University campus, the Sorenson Language and Communication Center (SLCC), completed in 2008 (see Figure 22.14), and the Living and Learning Residence Hall Number 6 (LLRH6), completed in 2012 (see Figure 22.15), served as a proving ground for developing the concept of the Deaf-architectural pattern language.

Both the SLCC and the LLRH6 were groundbreaking projects. The SLCC was built with great enthusiasm for creating the first building ever designed with the formalized DeafSpace patterns in mind. Although it is true that many buildings have been constructed over the years using these ideas, the SLCC is the first to both celebrate the aesthetic potential of DeafSpace and codify its underlying architectural language. The LLRH6 project built upon the SLCC lessons learned by restructuring the design process to make a space within contemporary building

Figure 22.14. The Sorenson Language and Communication Center at Gallaudet University, designed by SmithGroup Architects, is widely recognized as the first building in the United States constructed using DeafSpace principles. Image copyright Prakash Patel.

Figure 22.15. Living and Learning Residence Hall Number 6 at Gallaudet University, by LTL Architects and Quinn Evans Architects, was designed and constructed with DeafSpace principles and process in mind. Image copyright Prakash Patel.

practices so that the DeafSpace ideals could be realized as a complete work of architecture.

The SLCC was constructed as it was conceived. The building's design team faithfully incorporated the DeafSpace patterns identified by the 2005 DeafSpace Workshop. Because the workshop participants' focus was geared toward the building's collective and collaborative spaces, these were the spaces that received most of the design effort. Workshop participants envisioned the SLCC main atrium lobby as embodying a series of events people could engage in along their way to and from classes and departmental offices that would encourage interaction and showcase Deaf culture (see Figure 22.16).

Although the SLCC is a critically acclaimed success,[30] the building does not realize the full functional and aesthetic potential of Deaf architecture. Broadly speaking, the building presents occupants with discrete episodes of DeafSpace patterns, such as "Sliding Entry Doors," "Glass Elevator," "Conversation Circle," and "Soft Intersections," rather than a cohesive sensory experience. The building's craft, configuration of work spaces, choices of finish material, and color lack a deeper level of sensitivity, and the building maintains an ambivalent relationship to its site. These shortcomings are a result of the design sensibilities and pressures within our contemporary building industry rather than the talent or effort made by the building's designers and builders.

Even though the new SLCC building clearly incorporated DeafSpace patterns, it lacked the syntax imparted by the pattern language's organizing principles. This realization was a call for a different, more sensitive approach to the entire building-delivery process. The SLCC was delivered through a traditional "design–bid–build" method wherein the architect is selected for its cost and qualifications and the builder is selected based upon qualifications and a bid on construction

cost after the design is complete. The traditional method is inherently one of disconnection, purposefully set up to create checks and balances between the owner, architect, and builder. As each party advocates for its own, often divergent interests, pressures of schedule and budget and legal concerns often obscure attention toward design sensitivity and generative interaction.

In its pure sense, traditional design–bid–build is the antithesis of the collectivist way of building, where early and sustained partnership between the owner, architect, and builder is fundamental. By collaborating from the outset of a project, the three parties are afforded the opportunity to establish a meaningful relationship built on trust, curiosity, and a shared vision for the project. Under these

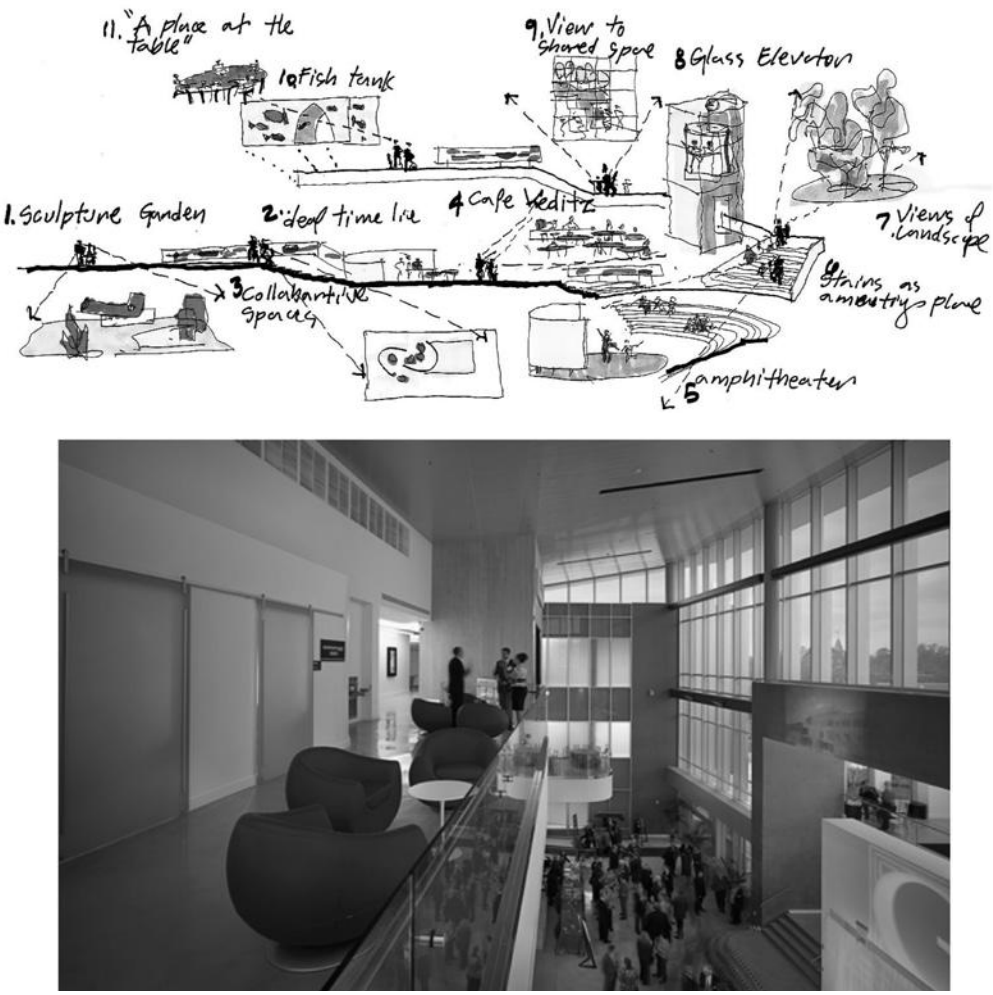


Figure 22.16. The main lobby of the Sorenson Language and Communication Center was designed as a series of DeafSpace patterns to be experienced as a story line of Deaf culture. Here is the initial sketch and the lobby as it was completed, in 2008.

conditions, it becomes possible to devote greater attention to design solutions embodying the subtle relational complexities that better attune buildings to their occupants' sense of well-being—for Deaf and hearing alike.

When Gallaudet University set out to construct its next major building, the LLRH6 residence hall, the delivery method was reconceived as a "design–build competition" through which a team of architects and builders was to be selected based upon the results of a six-week interactive design process. The competitive process allowed relationships to form and be tested, as designs were developed in collaboration between the Deaf stakeholders and four competing teams. The winning team was selected for its open and empathetic approach to the collaboration and for the sensitivity of the design solution it guided.

Reframing the delivery method as a collectivist way of building created a forum through which Deaf people's insights could guide talented architects and builders toward the physical realization of the Deaf-architectural pattern language. With the process in place, it became possible to explore more deeply the sociospatial nature of the DeafSpace patterns and the ways they could best mediate the forces of the site, the building's function, and the sensory experience of its occupants. The way in which the LLRH6 meets the ground is a particularly poetic example of the organic synthesis of place, functional needs, and aesthetic expression that *is* the Deaf-architectural pattern language.

The LLRH6 sits on a narrow, sloping site directly west of the SLCC on the Gallaudet campus. The building was envisioned as a "home away from home" for its residents on the upper floors and a collective gathering area for all of the campus community on the ground floor. The primary ground-floor social space is the Terrace Lounge, named for its terraced floor consisting of four separate tiers linked by a sloping ramp (see Figure 22.17). The lounge features a fireplace on the lowest, "living room" tier and a student-operated coffee bar on the uppermost tier next to the main student entry.

The stepping of the Terrace Lounge floor exemplifies the ordering principle "Organic Functionality." Long before the design started, there was a desire to have a lounge space that, like the conversation circle, could flex easily to accommodate a variety of different social situations, from large gatherings to small-group conversations, while maintaining sensory connection. By stepping the floor along the site's natural topography, the lounge offers excellent sight lines for large audiences viewing a presentation and intimately scaled niches for multiple small-group meetings without the awkward moving of walls or furniture. The terraced floor offers the added advantage of lowering the building's overall height and significantly reducing impacts to the site.

Following the site's gentle slope, the Terrace Lounge floor and the subtle way it is revealed on the facade of the building visually connect the specific condition of the place with the practical need for sight lines to see sign language and the cultural desires to gather (see Figure 22.18). The end result is a unified design

Figure 22.17 (*above*). The Terrace Lounge of Living and Learning Residence Hall Number 6 is designed to fit the sloping site and to provide clear sight lines for a variety of social settings. The room functions for both large lectures and casual conversations. Image copyright Prakash Patel.

Figure 22.18 (*below*). The western facade of the Living and Learning Residence Hall 6 Terrace Lounge enhances visual communication for large lectures as well as multiple intimate conversations. Image copyright Prakash Patel.

solution derived from an exchange between the physical place and the way it is uniquely inhabited—in other words, it is the physical manifestation of the Deaf ways of dwelling. Recognizing and acting upon the sloped site's potential for creating a place for gathering and communication are an example of the principle to be "of a place."

DeafSpace as a Vernacular Pattern Language

The DeafSpace pattern language possesses all the characteristics of vernacular architecture. Broadly defined, vernacular architecture is not considered within the mainstream of architectural discourse; it is a purpose-built architecture indigenous to a particular place, people, and culture and evolves over time in direct response to specific environmental and cultural conditions.

For the purposes of this chapter, "vernacular architecture" refers to a relatively primitive way of building, where one's community is constructed and maintained by its inhabitants, not by professional architects or builders. As stewards of their own place in the world, residents of early vernacular places possess a sense of self that is inseparable from their physical surroundings, temporal rhythms, and folklore. Juhani Pallasmaa contemplates the vernacular as a "[p]rofound architecture [that] responds equally to the requirements of the body and the mind. . . . It choreographs the acts, events and movements of daily life."[31]

DeafSpace exemplifies the aspect of vernacular architecture that is about functional relationships between human habitation and place, yet, unlike traditional vernacular architecture, its prime motivation—Deaf sensibilities—is locked not to a particular place but to a people who inhabit all places. For the Deaf community, the DeafSpace pattern language serves as a proxy that fulfills the longing for a homeland by empowering individuals to build a place that expresses shared Deaf experiences rooted in the specific conditions of where they are. For the architectural profession, it provides a practical guide and mind-set with which to think about building for Deaf people specifically. Broadly speaking, it calls for a more thoughtful approach about process and a deeper awareness of the intimate interplay between our built environment and well-being. A more sensitive approach will give rise to a multitude of architectures with the common theme of connection.

Deaf Gain for a More Sustainable and Livable World

The emergence of DeafSpace at the beginning of the twentieth century is timely, as it coincides with an even larger quest for cultural and spatial connection in our

society. Universal design and sustainability movements frame a broad range of scale, from the body to ecosystems in which people and place interact. The fact that both movements are now household terms is evidence of society's growing desire to connect in a deeper, embodied way with the world that sustains us. Within this context, the possibility of a Deaf architecture not only fulfills an age-old longing among deaf people to "build a place of our own" but also provides a model for building a more sustainable and livable world for everyone.

DeafSpace: Deaf Gain for the Modern Paradigm of Disconnection

Throughout history, the making of human settlements has moved from an intimate engagement of necessity between people and place to a ubiquitous industrial complex. In the Gothic era, architects were better known as master builders, placing them at the lower end of Plato's sociosensory hierarchy. Beginning with the Renaissance, the profession of architect deliberately moved toward the higher order of the philosopher, leaving behind the embodied knowledge of the artisan. Reinforced by architectural pedagogy, architects practice within an ivory-tower profession, isolated from those they serve and the craft of building. In contrast to their vernacular counterpart, "[modern] architects think about buildings and objects, not processes and temporal continuum." Modernity "separates mind and body, body and space."[32] It is a separation that for decades has led architectural education and the profession to produce buildings to look *at* rather than to be *in*.

The standardization of the built environment that began in the Industrial Revolution exacerbates the modern disconnect between human sensibilities and the ways in which we construct our built environment. Through the standardization of materials, building practices, and codes, specific site conditions no longer play such a formative role in the design of buildings. Spurred by the allure of universal predictability, the franchise of standardized building types and styles nullifies meaningful connection.

The pervasive move toward sterility is worrisome, as it is a fundamental contributor to the adverse environmental and humanitarian impacts ranging from a barrage of environmental stressors in our daily lives to needless environmental degradation. Even worse, it tends to be self-propagating. As Pallasmaa points out, "The fusion of self and setting is so complete that we tend to become blind to the characteristics and qualities of our environment."[33] Left unchecked, where is all this heading?

Deaf people and their linguistic, cognitive, and cultural spatial sensibilities offer an alternative approach to the modern paradigm of disconnectedness that grips current design and building practices. The DeafSpace pattern language builds a bridge between deaf spatial sensibilities and the architectural discourse to enable deaf people to act on their own behalf as well as for society at large to construct more sensitively designed spaces. Ultimately, through sustained effort,

it is possible for deaf people to play a leading role in guiding our society toward the making of places in which to dwell rather than spaces to merely occupy.

The massive design-and-construction industry is not changing anytime soon. Nevertheless, through the promotion of deaf people's architectural pattern language and the education of design and construction professionals in the DeafSpace idiom, as well as the construction of projects that are more in the spirit of the collectivist way of building, like the LLRH6 example given earlier, it is possible for Deaf people to have a significant impact on the way our environment is conceived and constructed within a relatively short time frame.

Herein lies one of the lessons DeafSpace has to offer architects, whether in academic or professional situations: inherent to the collectivist way of building are a pace and openness that encourage broad participation, empathy, and curiosity. In order to grow from within, the DeafSpace process empowers individuals to explore personal relationships with their surroundings to enable actions that fit their needs and identity. The role of the architect as the problem solver and author shifts to that of teacher, facilitator, and collaborator. The role of the Deaf person shifts from passive client to teacher, creator, and collaborator.

At a deeper level, DeafSpace introduces the ideas of embodied knowledge, awareness, and sensitivity and their application within the architectural discourse. The idea of "building as the third person" is a powerful example of empathy translated into built form. If greater awareness of this kind of empathy can be achieved on the scale of two walking signers, could it not be scaled up so that architects could bring it to their work as teachers, facilitators, and collaborators?

It is both right and possible for architects, who possess the daunting responsibility of making the places we inhabit, to glean skills of empathy from the deaf community. A more empathetic approach would enable architects to enhance their awareness of and sensitivity to the physical aspects of their work and the people they work with. Furthering society's pervasive desire for connection to place, architects can apply DeafSpace lessons learned across the scale of the design problems they encounter, from universal design's focus on the way the body touches architecture to sustainability's systemic considerations of ecosystems.

DeafSpace: Deaf Gain for Universal Design

The establishment of the Americans with Disabilities Act of 1990 (ADA) serves as a profound testament to the gap between our diverse humanity, or who we are, and the spaces we inhabit. The design standards established by the ADA have altered the shape of our environment to accommodate the needs of people with "disabilities." The emergence of universal design has broadened the scope of environmental accommodation to a more thoughtful approach to "design for all." Although the ADA has successfully legislated environmental accommodation and universal design has enriched the ways designers think about access, they do so using a top-down approach focused on the accommodation of universal impair-

ment rather than building on the sense of empowerment that comes from dwelling within a place that expresses one's unique way of being in the world.

Both the ADA design standards and mainstream universal design discourse have predominantly overlooked the sensory and sociospatial needs of deaf people much beyond technology and building systems related to communication access. Yet Deaf people, and indeed Deaf culture, are, in part, defined by everyday acts of cultural customization. Perhaps the very fact that deaf people customize their environments from a cultural perspective rather than a purely technical one may be why their unique architectural ways have yet to be understood by the broader dialogue on universal design.

Ironically, the most valuable lessons universal design and architecture in general have to learn from Deaf people are rooted in Deaf culture—specifically in Deaf people's ways of dwelling. When environments are made in a collectivist way, with a deep sensitivity and awareness of the needs of others, the specific physical and cultural forces of a place and the process of making it offer a new way to design environments attuned to the full range of sensory and physical abilities. The closer contact with specific site and cultural conditions aims to create a new generation of safe and comfortable environments constructed around an aesthetic that reinforces positive identity and empowerment rather than universal notions of accessibility.

DeafSpace: Deaf Gain for the Sustainability Movement

Today, against the backdrop of climate change, population growth, industrialization, and migration, a close examination of the very essence of humankind's relationship to our environment is imperative. Stresses caused by the disconnect between the way we design our spaces and the way we actually sense and engage our spaces undermine our well-being and exacerbate the potential destabilizing effects of the extraordinary socioeconomic and environmental challenges of our time. As populations shift and urban centers expand, it is possible to imagine that "quality of life" will rank with "access to resources" as a national-security issue.

The buildings we inhabit contribute nearly 40 percent of the emissions of and energy used in the United States.[34] The sustainability, or "green," movement is responding with one of the most rapid and significant changes to our architectural landscape in modern history. Nevertheless, the relatively young initiative remains focused on means and measures for improving energy consumption and reducing emissions, overlooking humankind's most basic sociospatial relationships.

Frank Gehry, the architect famous for his titanium-scaled landmark buildings, complained about this oversight in a 2010 interview with Abby Leonard. Gehry, a winner of the Pritzker Prize, was critical of the green building movement, having called it "bogus" and "fetishized." After touting his own work, the celebrity architect ended the interview by explaining how buildings like the Incan temples he had recently visited in Peru provide primitive insights for creating a truly sus-

tainable architecture.[35]

This shift of attention toward a more primitive, or vernacular, way of building by such a prominent architect charts a future for the sustainability movement that will seek to build a greater connection between human experience, place, time, and community. Through the vernacular wisdom of DeafSpace, Deaf people can develop novel and embodied architectural sensibilities uniquely well suited to advance the sustainability movement's unrealized need for connectedness.

Although perhaps broader in scope, current societal longing for greater connection with our physical world is similar to Deaf people's search for a Deaf home. In many ways, the deaf search is more developed than that of what we now refer to as the green or sustainability movement. In Deaf culture, there already exist an innate and broadly shared spatial awareness and a vernacular sensibility for a way of dwelling. Ultimately, there is a shared pent-up desire to create a place responsive to and expressive of Deaf people's ways of being.

The green movement, by contrast, remains in its infancy with architects like Gehry searching for a new way of building and, even more profoundly, wondering how they actually relate to place, not in an abstract, cerebral sense but in an embodied sense—the kind of sensibility so deeply ingrained in Deaf culture. The claim here is not that a wholesale return to a vernacular or Deaf way of dwelling is a panacea but rather that a broad-based awareness of, and a renewed design sense for, our everyday surroundings that is more closely tied to our human sensibilities will contribute to a healthier, more sustainable world.

DeafSpace: Deaf Gain for a More Livable and Sustainable World

The myriad of design professionals, builders, businesspeople, and policy makers who bring us our standardized living environments today have much to learn from Deaf people and their unique sociospatial sensibilities. Some of the early lessons have been outlined in this chapter, and certainly there are more to come. But perhaps the most profound lessons reside in the power latent in Deaf ways of dwelling as a paradigm of unity from which empathy and curiosity grow. If it is possible to "bottle" the generative energies of "architecture as the third person" or "sensory reach" or "the collectivist way of building" and apply their salve to the urgent sustainability agenda, it is conceivable that Deaf people can redirect the conversation to the making of places that express our connections rather than our barriers. DeafSpace is about what Maurice Merleau-Ponty calls "experiential knowledge of place, one in which our body feels the world in feeling itself."[36] I am hopeful that within this "insoluble unity of life and place" lies the seeds of a new way of building, of knowing and caring for the ecosystem we call the place of our own.

Notes

1. Hansel Bauman, "DeafSpace Design Guidelines" (campus design guide, Gallaudet University, 2010).

2. Carol Padden, "The Decline of Deaf Clubs in the U.S.: A Treatise on the Problem of Place" (unpublished manuscript), quoted in Matthew Malzkuhn, "Cultural Customization of Home" (master's thesis, Gallaudet University, 2009), 7.
3. Christian Norberg-Schulz, *The Concept of Dwelling* (New York: Rizzoli, 1985), 5.
4. Ibid., 13.
5. Norberg-Schulz, *The Concept of Dwelling*, 5.
6. Juhani Pallasmaa, preface to *Nesting: Body, Dwelling, Mind*, by Sarah Robinson (San Francisco: Stout, 2011), 5.
7. Malzkuhn, "Cultural Customization of Home," 14.
8. "Famous Quotations and Stories," Churchill Centre, WinstonChurchill.org, http://www.winstonchurchill.org/.
9. Pallasmaa, preface, 4.
10. Robinson, *Nesting*, 34.
11. Malzkuhn, "Cultural Customization of Home."
12. Benjamin Bahan, "Memoir upon the Formation of a Visual Variety of the Human Race," *Deaf Studies Today* 1 (2004): 26.
13. "Famous Quotations and Stories," Churchill Centre, WinstonChurchill.org, http://www.winstonchurchill.org/.
14. Christopher Alexander, *A Pattern Language* (New York: Oxford University Press, 1977); Christopher Alexander, *The Timeless Way of Building* (New York: Oxford University Press, 1979).
15. Alexander, *A Pattern Language*, x.
16. Hansel Bauman, "A Case for SLCC Aesthetic Principles," 2005.
17. H. Bauman, "DeafSpace Design Guidelines," 30.
18. Ibid., 35.
19. Ibid., 78.
20. H. Bauman, "DeafSpace Design Guidelines."
21. Bahan, "Memoir upon the Formation of a Visual Variety of the Human Race," 26.
22. H. Bauman, "DeafSpace Design Guidelines," 66.
23. Ibid., 45.
24. Ibid.
25. Anna Mindess, *Reading between the Signs* (Boston: Brealey, 2006), 41, quoted in Malzkuhn, "Cultural Customization of Home," 99.
26. Malzkuhn, "Cultural Customization of Home," 11.
27. Ben Bahan and Dirksen Bauman, DeafSpace Project, class discussion, November 2006.
28. H. Bauman, "DeafSpace Design Guidelines," 67.
29. Ibid., 56.
30. American Institute of Architecture, Maryland State Chapter, award-ceremony announcement, May 2009.
31. Pallasmaa, preface, 5.
32. Ibid., 6.
33. Ibid., 1.
34. Environmental Protection Agency, "Green Building: Frequent Questions," http://www.epa.gov/.
35. Abby Leonard, "Architect Frank Gehry Talks LEED and the Future of Green Building," *Need to Know*, PBS, http://www.pbs.org/wnet/need-to-know/culture/architect-frank-gehry-talks-leed-and-the-future-of-green-building/1458/.
36. Maurice Merleau-Ponty, "The Visible and the Invisible," quoted in Robinson, *Nesting*, 146.

23

CO-DESIGN FROM DIVERGENT THINKING

ANTTI RAIKE, SUVI PYLVÄNEN, AND PÄIVI RAINÒ

In this chapter, we seek to deepen the meaning and value of "Deaf Gain" within a co-design process. We will use the term *co-design* to cover co-design, participatory design, and some methodologies of user-centered design, although we are aware of the differences between these various methodologies in present design research. Divergent thinking is an integral process in creativity and innovative knowledge building, and it can include or amplify positive Deaf Gain impacts intentionally or by serendipity. We will present findings from two co-design Web-site projects made at the Aalto University in collaboration with Finnish Deaf communities. Our case studies are culturally grounded in both activity theory and action-research traditions. The first case is the CinemaSense project (2000–2004), involving Deaf university students and media professionals. The second case is the Knack project (2008–9), in which Deaf participants sought to improve the user experience of Deaf-related Web sites. Both projects were executed iteratively and in collaboration with users, designers, and researchers, and both claimed a much stronger visual presence than was habitual in the Web platforms of their times, defending the right to pack information and communicate using a Deaf perspective.

Collaborare Necesse Est!

We rely on the assumption that learning is a collaborative rather than a merely individual and mental process. Problem discovery by the participants themselves is an important step in the creative process. Recently our ideas of design, learning, and possibilities for collaborative knowledge building have drastically changed, but the rate of change in education and reformation of social structures is sometimes painfully slow.[1] Various co-design methodologies seem to support effective learning and personal reflection by augmenting collaborative knowledge building with peers. Thus, the objective of the present chapter is to recognize Deaf Gain practices that facilitate the development of skills and competencies involved in the deliberate creation and building of knowledge by and with multimodal digital tools.[2]

The history of the Internet is replete with innovations that came from collaborating individuals, whose ideas spread through a grassroots network of early adopters and tinkerers. The so-called alpha geeks are smart enough to make technology do what they want rather than what its originators intended. Tim Berners-Lee started the World Wide Web because he was frustrated with the information-sharing difficulties at CERN (European Organization for Nuclear Research), near Geneva, Switzerland. *Wikipedia* is an example of an open project to build an online encyclopedia in collaboration with any interested person on the globe. Linux (aka GNU/Linux) is only one example out of thousands of open-source software projects around the world that were created collaboratively by people who have written software for fun and have given their intellectual property away for free: This could be coined "education gain" for the culture, because higher education offered necessary resources for the developers and inventors.

We present two projects made with Deaf participants as case studies. The purpose of the first case study was to produce an accessible set of Web-based study material concerning cinematic expression, entitled CinemaSense. This study shows the implications of creating more accessible learning environments with Deaf students and media professionals in higher-education contexts. The purpose of the second case study was to produce a Web site that was culturally accessible for Deaf people. The Knack Web site was designed especially to inspire, encourage, and inform Deaf and hard-of-hearing children with (or without) learning difficulties. Together, the projects demonstrate the importance of involving Web-site users as participants throughout the design process and, thus, the significance of co-design with Deaf communities.

We argue that one of the challenges facing Deaf participation at every societal level is the lack of knowledge about the possibilities that the modern social media offer to citizens and stakeholders. Furthermore, following the philosophy presented by H-Dirksen Bauman and Joseph Murray,[3] if the profits of education gain are forwarded to Deaf people to be further developed by co-design strategies, thereby taking advantage of the unique Deaf ways of being, then forms of cultural production may provide us with new areas of experimentation and insight, leading us to a real Deaf Gain in education.

Michael Gibbons and colleagues map changes in the mode of knowledge production and the global impact of such transformations, identifying "traditional knowledge" as mode 1—that is, knowledge generated within a specific disciplinary (such as Deaf education), cognitive, and primarily academic context. Consequently, the traditional formal model of teaching has been a top-down activity conducted in rather static groups in the hope of affecting the behavior of a Deaf individual instead of a community of Deaf collaborators. Mode 2, by contrast, represents knowledge generated outside academic institutions in broader, transdisciplinary social and economic contexts.[4] According to Kari Kuutti, an interesting development is happening within academia itself, seemingly pointing in a

direction where existing disciplines imitate a way of producing knowledge similar to design. Thus, mode 2 as a method would have potential value for Deaf Gain, because educated Deaf people would work on different fields in society. The transition from mode 1 to mode 2 in higher education in the past few decades has been precipitated mainly by a dramatic expansion of possibilities that has created a surplus of highly skilled Deaf graduates who could not be absorbed into traditional academic settings.[5] In general, the students of higher education arguably take too many years in acquisition-oriented and teacher-centered studies without developing their own undertakings, which would genuinely advance their knowledge.[6] This tendency accumulates even more challenges for Deaf students who use visual language. Traditional mode-1-style education may fail to provide Deaf students with competencies to solve the complex and ill-defined problems of professional life and thus precludes Deaf Gain in co-design projects.

Indeed, instead of directly assimilating information, students should learn to construct knowledge through solving problems in communities of practice.[7] An effective mode-2 enterprise starts quite often with an interesting problem and with people who want to solve it and are exercising knowledge and technology to the fullest because exploring new ideas in collaboration with diverse peers is fun. Anita Williams Woolley and colleagues believe that collective intelligence stems from how well a group works together. They conducted studies at MIT's Center for Collective Intelligence and at Carnegie Mellon University, where people were placed in groups of two to five. A result was that groups whose members had higher levels of "social sensitivity" were more collectively intelligent. Moreover, the researchers found that the quality of performance of a group was not primarily due to the individual abilities of the group's members.[8] Hence, we need to realize that collaboration and peer-to-peer learning are essential as the diversity of stakeholders increases everywhere in society. Community-building skills are especially important in the case of Deaf graduates, who often have to cope with university requirements and educational contexts designed according to the needs of the hearing majority, with resources available only to the latter group.

Background: Divergent Thinking and Collaborative Design with Stakeholders

We propose to encourage divergent thinking and co-design for capturing the tacit knowledge dimension of Deaf participants and even for pursuing Deaf Gain. The large majority of research concerning interface design for "disabled" people, including nonsighted and Deaf users, among others, takes for granted the assumption of deafness as a medical disability. Research in the area lacks examination of the relation between Deaf people and interfaces in their social context, that is, how Deaf people constitute meanings in relation to their social milieu, how these meanings affect the aesthetics of these interactions, and how to organize results in a way that reflects the world as Deaf people perceive it.[9] Thus, divergent

thinking and resultant serendipity for creative co-design were essential for our studies.

According to Thomas Suddendorf and Claire Fletcher-Flinn, creative thought, like language, requires informational access to the varied domains of knowledge as part of the generative process of combining and recombining items into virtually infinite numbers of novel sequences. The essential element of creativity remains divergent thinking, which requires flexibility. Research findings indicate that divergent thinking involves tolerance to ambiguity and lack of rigidity. Divergent thinking is a thought process or method used to generate creative ideas by exploring many possible solutions. It is often used in conjunction with convergent thinking, which follows a particular set of logical steps to arrive at one solution, which in some cases is seen as a "correct" solution. Divergent thinking typically occurs in a spontaneous, free-flowing manner, so that many ideas are generated in an unorganized fashion. Many possible solutions are explored in a short amount of time, and unexpected connections are drawn. After the process of divergent thinking has been completed, ideas and information are organized and structured using convergent thinking.[10]

The design challenge for both CinemaSense and the Knack project was to create conditions for the objective study of a subjective topic, that is, how Deaf users evaluate Web sites and how Web-based course material should be structured. We also used co-design as a formative intervention to reveal the social, cultural, and political character of the design process and to give space to Deaf expertise and open up a way to build motivation or, more appropriately, to turn motivation into agency.[11] Naturally, Deaf people are the experts in their own motivation, and they possess a critical awareness of factors that prevent or distort their motivation to learn or to use Web sites.

However, designers have noticed the usefulness of inclusive co-design for everyone: good design challenges the old paradigm of "special needs."[12] Involvement of user communities is especially important when services and products are developed for purposes of inclusive education.[13] Kevin Carey summaries that all the components for effective accessibility in converged digital data ecology exist, but they need to be creatively combined, that is, designed. "Design" refers to planning, shaping, giving form, and developing a product or service. It involves not only designing an artifact but also exploring, testing, and cultivating social systems and practices related to the use of the artifact; hence, the latter processes may be considered an essential aspect of designing.[14] Both CinemaSense and Knack involved intensive interaction between the systematic advancement of design ideas; the implementation of the ideas in the design of technology tools and services; an exploration of the ideas, tools, and methods used in pedagogical practices; and further development of both the ideas and their technological implementation.

User experience is an essential part of good design and effective accessibility. In order to design interfaces that delight their users, a designer needs to under-

stand the users and their needs. In recent years, the concept of user experience has shifted from the traditional focus of usability research to include emotional and cultural design aspects.[15] In order to enhance user experience, it is important to identify features that are likely to facilitate product acceptance, such as identity, meaning, traditional aesthetics, and bonding, as well as to understand how to design interfaces that are compatible with users' cognitive patterns. This knowledge includes respect for users, a commitment to user needs and desires, and a holistic understanding about the interaction that is influenced by one's culture. Klaus Krippendorff goes further, arguing for a semantic turn in design and proposing that design involves an "understanding of the understanding of others."[16] If we identify the factors that bring joy and fulfillment to sign-language users, we can enhance the way interfaces are designed for them and by them; a successful culture-oriented product design is greatly affected by the enjoyment it affords.[17]

Next, we will present two co-design case studies in chronological order. The first case is the CinemaSense project, made in 2000–2001 to understand and enlarge the principles of networked learning. The second case is the Knack project, in 2008–9, designed to rethink and reformulate accessibility with Deaf participants. Both cases serve as co-design examples of possible Deaf Gain in design-research tradition. Antti Raike focused on developing a Web service related to the basic studies of film art.[18] Suvi Kitunen aimed to develop a pilot site for the Knack project in order to identify interface features that enhance the browsing experience of Deaf people.[19] The studies were grounded in the belief that if an interface meets one's cultural needs, it enhances one's learning and browsing experience. This form of thinking is grounded in the newest turn in user-experience studies that acknowledges the importance of culture and collaboration in design.

CinemaSense: A Collaborative Effort to Learn Film with Deaf Students

CinemaSense is a user interface of collaborative learning, Web-based study material, Web portal, and service. It was at once the aim of the study, one of its methodological instruments, and the most important outcome of the project, that is, an independent design artifact for its own sake. The research-and-design process of CinemaSense is reported in detail in several articles;[20] the present chapter focuses on examining the role of Deaf participants who had an essential role in the iterative development of CinemaSense (and the possible Deaf Gain that resulted). The project, qualitative in nature, was realized already at the beginning of 2000,[21] a decade before Bauman and Murray suggested conducting research to study Deaf Gain and "the potential innovations emerging from Deaf filmmakers."[22] Instead of being "a rigorous educational film program" for Deaf schools, the CinemaSense co-design project was realized with future Deaf class teachers and potential Deaf and hearing filmmakers and students of art in higher education. Instead of an educational film program, a visual educational Web-based learning

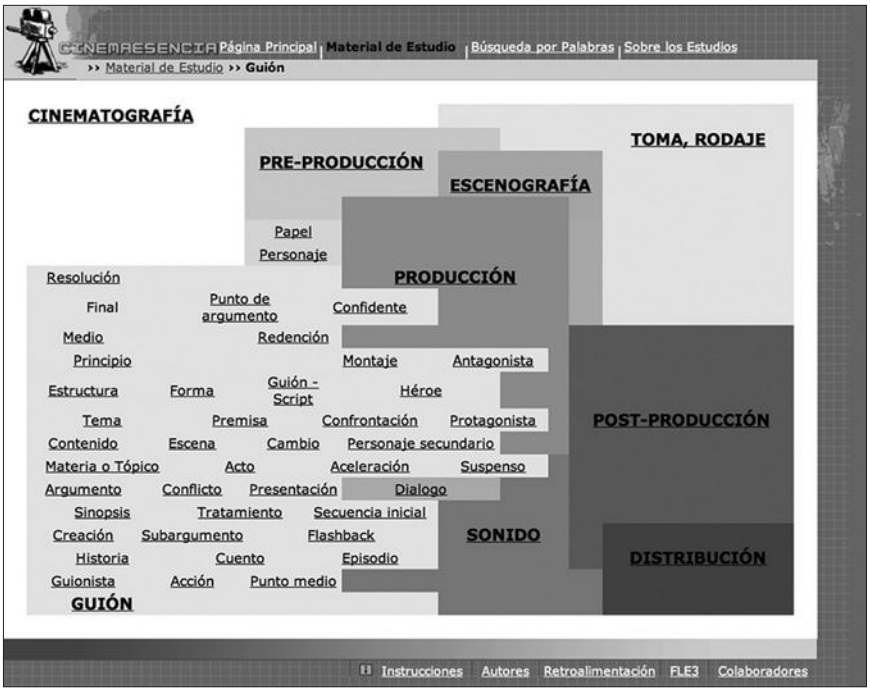


Figure 23.1. The CinemaEscencia (CinemaSense) learning map of screenwriting (Material de Estudio) in Spanish, found at http://elokuvantaju.aalto.fi/. The map-like interface is organized as a flowchart with concept maps. The film-production chain, from an idea ("concept") to a distributed film, is visualized comprehensively: an idea emerges within the cinematography area (white) and advances from the upper-left corner through three production stages to the distribution of a final-release print of a film in the lower-right corner.

tool was created that, after a decade, is still in use as an open-access study material (see Figure 23.1).[23]

Another interesting, convergent coincidence with the theoretical proposal of Deaf Gain and its inherent cosmopolitan nature[24] was the fact that the CinemaSense Web site was, from the very beginning, designed to be a multilingual implement that could be used by Deaf or hearing users of English, Spanish, Japanese, Finnish,[25] and Columbian[26] sign language (Figure 23.2). Thus, the more practical goal was to develop the accessible CinemaSense Web service for providing basic information on film art for every interested learner.[27]

The CinemaSense project explicitly aimed to make the collaborative learning of films and filmmaking accessible to students using sign language. An additional purpose was to develop the tools and practices of networked learning, which were more accessible and flexible to all students according to the principles of open access and inclusive design.[28]

The co-design part of the project in 2000–2001 aimed, first, at examining how

Figure 23.2. The CinemaEscencia learning module "El Doble," in Colombian Sign Language. Colombian Sign Language signs are given for concepts explained in Spanish. The signer is Colombian fashion designer Andrea Rodríguez Escudero. The signs were collected and translated by Deaf media professionals. http://elokuvantaju.aalto.fi/spanish/authors/colombia_team.jsp.

inclusive art studies can be implemented in practice and how the accessibility of film studies can be supported.[29] The second aim of the CinemaSense project was to analyze the Deaf students' knowledge building and conceptualization related to film expression, as well as their collaboration during the Web-based course. The third aim was to analyze how the imitation of professional production of a documentary film facilitated the development of CinemaSense: how would the overall film production from an idea to finished product become structured through Web-based learning so as to fit the three stages of film production, namely, preproduction, production, and postproduction? Participation in genuine film production was intended to guide participants in problem-driven learning in which each student might assume an expert's role and engage in solving corresponding problems in practice.

In developing tools for collaborative learning, one cannot advance straightforwardly from ideas to their implementation; a more complex process is needed in which ideas and visions coevolve with the experiences and practices of the user communities involved.[30] Thus, an essential aspect of CinemaSense processes is their iterative nature, where the formative intervention overlaps with the production. One of the methodological challenges was to examine how the accessibility of academic studies in an artistic institution can be elicited. What kind of methods and services are needed to make basic film studies accessible to Deaf students?

Toward that end, the CinemaSense project involved the parallel pursuit of developing the Web service and analyzing the conceptualization of cinematic expressions with the help of two student groups.

The first group, called the "Novice Group," consisted of seven Deaf teacher students[31] who engaged, during 2000–2001, in a two-year Web-based study concerning cinematic expression, culminating in making their own documentary film in 2002. Six out of seven participants considered themselves Finnish Sign Language (FinSL) users whose second language was Finnish; the seventh participant was also confident with FinSL. The "novice" participants were majoring in education and aiming at becoming classroom teachers at the primary level of education after five years of study to get their master's degree.

The "Expert Group" consisted of five full-time Finnish-speaking master's-level film students majoring in film art at the Aalto University School of Arts, Design, and Architecture in Helsinki, Finland. These students aimed to become professional filmmakers as directors, film editors, cinematographers, or producers. After either a three- or a five-year study program, they would become, respectively, candidates or masters of fine arts. Consequently, this group was, in a concrete way, intellectually socialized toward appropriating a filmmaker's perspective on film art.

The groups resembled each other in respect to the members' ages (mean = 28, standard deviation = 26) and number of languages mastered. The diversity of the groups was a consequence of an intentional choice in designing CinemaSense; Raike sought to use the diversity—and the possible Deaf Gain—of the groups as a productive instrument for collaborative learning about film art through active filmmaking instead of examining how the Deaf users' learning differed as such from that of hearing students.[32]

The ways that the participants in the Expert Group conceptualized films provided a comparison base for assessing the Novice Group's evolving knowledge of and expertise in film art. Using concept maps, the two groups' evolving cinematic knowledge was examined and utilized while developing the maplike user interface of CinemaSense across three iterative design cycles. During the co-design, the Deaf students analyzed films, wrote about their own experiences, and represented their evolving cinematic knowledge through constructing concept maps (Figure 23.3).

By the end of the Web-based course, the concept maps of the Deaf students had developed from film-viewer maps to novice filmmakers' maps. Thereby, the participants relying on FinSL developed expert-like cinematic knowledge. Multilevel evidence indicated also that the Deaf participants adopted a filmmaker's perspective on movies. In addition, Deaf students' divergent—or even radical—thinking about "a Web site" and ideas of filmmaking in Finnish Sign Language indicated some positive impacts that could be further labeled Deaf Gain.

Toward that end, Deaf participants studied professional production, designed and developed the subject of a documentary film, organized the production, and

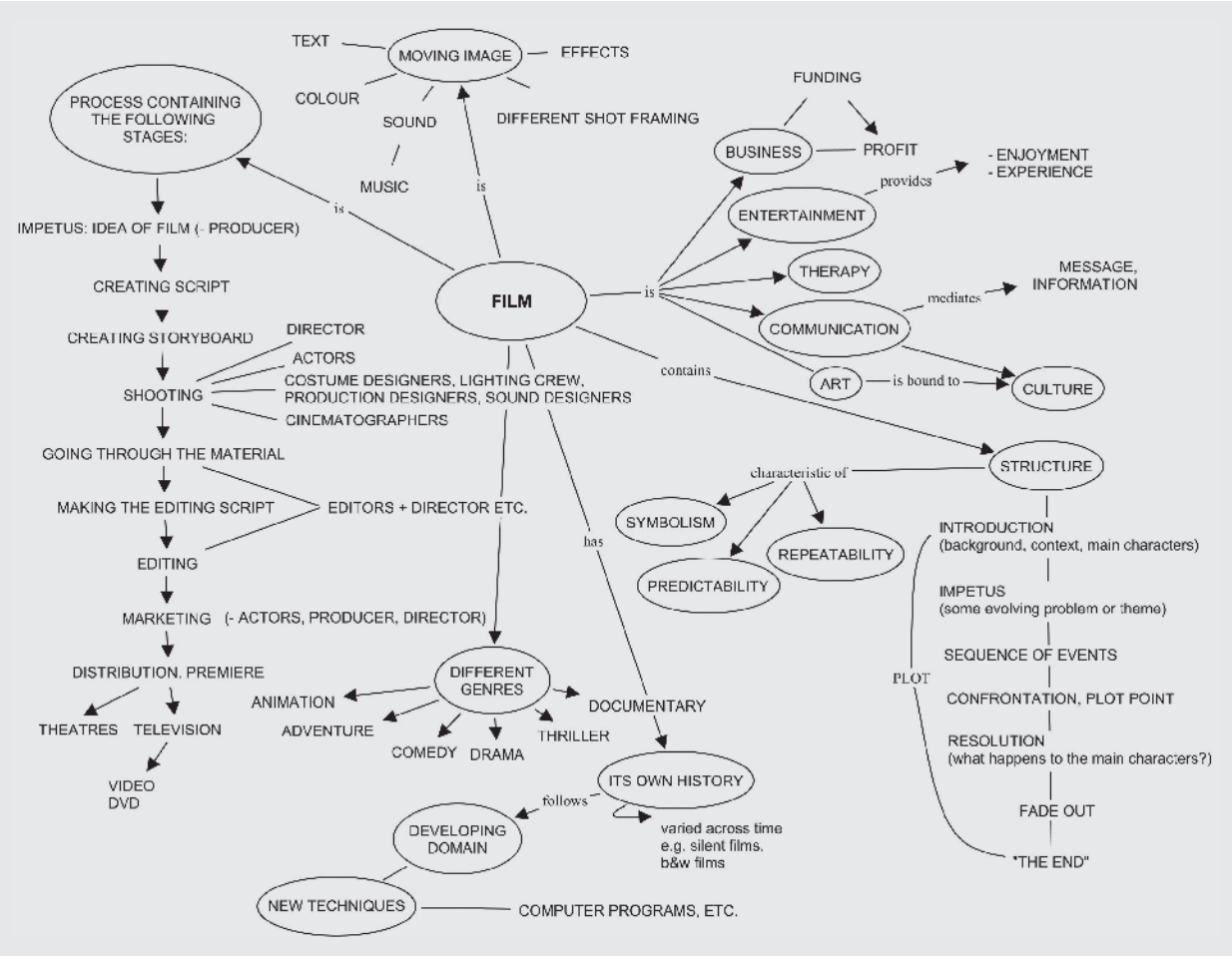


Figure 23.3. A reconstruction of participant 4's final concept map. This concept map of a Deaf student from the Novice Group indicates progress from a viewer to a filmmaker.

produced three short documentary films. In independently functioning pairs, they cut from jointly shot material three documentaries as the final report of the course project. Raike and colleagues assumed that by challenging the Deaf participants to produce their own documentary films, they would imbibe knowledge practices characteristic of professional filmmakers and adopt associated professional roles; hence, the participants would learn to take a filmmaker's rather than a film viewer's perspective on cinematic expression.[33] Thus, Deaf participants formed their own community of practice aimed at the production of a documentary, learned through their collaborative process to use relevant network services, and cultivated their academic skills.

The production-centered orientation is beneficial for a novice student, because

humans learn effectively by doing;[34] people grow up to become experts through participation in an expert community.[35] In production-centered knowledge practices, the participants learn to understand a director's, a producer's, and a scriptwriter's roles and the significance of their corresponding work performance for the creation of a film.

It appears that, when used in conjunction with collaborative learning environments, Web-based study materials such as CinemaSense can be productively utilized to support the learners' own knowledge-seeking inquiry, driven by their own questions and speculations, instead of merely to assimilate existing information.[36] Hence, a collaborative activity empowered Deaf students to contribute in a meaningful way and assisted in illustrating the possibility of Deaf Gain in co-design projects. In addition, Deaf students with a sight-based orientation to the world contributed to a multilayered visual presentation in CinemaSense, which was a novel option compared with the purely textual content-presentation style that was dominant in the early 2000s.

Knack: Designing a Deaf-Culture-Specific Web Site with Deaf Users

Knack is a Web-design project conducted by the Finnish Association of the Deaf (FAD) in 2008–9. The Web site (http://www.knack.fi/) was part of a larger project run by FAD Knack [in Finnish, *Osata*], in which the primary aim was to raise awareness of learning disabilities in Deaf and hard-of-hearing children as well as adults.[37] Altogether, sixteen members of the Finnish Deaf community (all Finnish Sign Language users) participated in the study. Participants were selected through purposive sampling based on the following: they were stakeholders of the Knack project; they had an interest in the design or its consequences; and they were willing to support and constructively criticize the development. They presented a wide range of Deaf community members: two were hard of hearing, and fourteen were Deaf, of whom four were dyslexic.

The primary aim of Osata was to raise awareness of learning disabilities in Deaf and hard-of-hearing children as well as Deaf adults and to promote new methods of remediation. The Knack Web site was designed to encourage Deaf and hard-of-hearing children to explore rhythmical play and exercises based solely on visual and kinesthetic impulses. The multisensory training of rhythm increases attention and develops early reading and writing skills, and it is considered beneficial even for dyslexic adults.[38]

The study aimed to understand the ways in which interfaces could become meaningful to Deaf users by considering the implications of Deaf culture and Finnish Sign Language as a first language on Web-user experience. The main driving force of this applied research was to tackle the problem of Deaf users' dissatisfaction with sites that are designed for them. Even Web sites that meet the accessibility criteria—and sometimes they especially—did not seem to attract Deaf users. When interviewed during the preliminary research, a group of Deaf people

stated that they are unable to engage with most Web sites for three reasons: first, because the sites were not in their own language; second, because accessible sites looked boring and ugly; and third, because they did not feel at home when using them.

In the course of the research, co-design research methods were used to help in understanding the "native" point of view. The design process involved three main phases: contextual inquiry through observation and stakeholder meetings; the identification of Deaf-culture-specific design features through a focus-group session, card sorting, and thematic interviews; and the integration of the identified design features by way of a brainstorming session, two collaborative workshops, and development of prototypes in collaboration with Deaf designers. Through divergent thinking, many possible solutions could be explored. Ideas and experiences from every session were fed back into the following workshops and finally into the development of prototypes. Because of tacit knowledge in this context, the purpose of the study was not to research quantitative or objective "truth" in its traditional sense but rather to look for inspirational and actionable insights on culturally rooted conventions that influence user experience, including functional and aesthetic choices that Deaf people make.

The results showed that there were huge differences in the ways that beauty and attraction were valued within the community, yet common themes could be identified: the importance of the stories, nature, beauty, visual clarity, people playing together, and images of hands. The participants emphasized their frustration with long paragraphs of text, a lack of images, slow uploading times, and overly textual navigation. Even if the participants were overwhelmed by text, some stated that they preferred to read text than to watch sign videos: they had to wait for videos to stream, whereas text could be scanned or read quickly. Most participants, however, would prefer visual and signed communication to text, if available. All the participants used both media and expressed that the one they used varied from one day to another.

We can make a distinction between participants' favorite Web sites and the ones they used in practice. It became evident that the most-used sites were news portals designed for hearing people, but when asked about sites that brought them enjoyment, paradoxically, participants showed sites targeted toward Deaf users. Still, most participants said that they would visit sign-language Web sites if they were better designed and offered content that interested them. Evidently, a signer on a Web site brought cultural value by giving access to participants' first language. The following dialogue illustrates the fact that participants favored sites where the signer was free-standing, engaging, and full of character:

> I like the French site. Let me see if I can find it. Here it is. You see. The signer is engaging and funny, interesting to follow. I also like the symbols

> they use for navigation. It's easy to explore even if I don't know any French. The way the signer is placed on the site is also different to what one normally sees on a Web site. Mmh . . . I don't like the way it's inside that box, though.

> Yeah, I don't like that either. You know the site . . . wait a moment. Here it is. This is a Finnish site. I like that the man is standing there freely. Though he is too small in size. It's hard to follow. But somehow it feels like it belongs there. It tells you what is there. I like that. But otherwise there is too much text on the site, and I don't like the colors. They are boring.

Following this line of thought, later in the study another participant stated this:

> [E]xpressive. The signer needs to be lively, creative. Humor is always good. Not too serious. There should be some kind of liveliness.

In addition, the visual surrounding was an important part of the design for the participants, as the following comments from different participants during a workshop session illustrate:

> The signed videos with plain backgrounds do not invite me to follow what is being signed.

> Blank backgrounds do not even arouse my interest to follow the signing.

Seven recurring themes regarding Web-site design could be identified in the focus groups: simplicity and clarity; visual guidance; vividness and engagement; a charismatic signer; a nonisolated signer; the clarity of the signing; and the speed of the Web site. The design process showed that even if visually engaging content was the key to liking an interface, ease of use and speed were equally important factors for Deaf participants. A signer on a Web site not only brought functional value as such but also brought culturally added value by giving participants access to their mother tongue. In addition to sign-language content, participants yearned for visual guidance such as icons for navigation, photos to illustrate the context of signing, colors to visually differentiate different sections of the site, and visual responses to mouse movements to clarify functionality (Figure 23.4).

Both the user research and the literature have illustrated that not everyone in the Deaf community fits the cultural pattern precisely, but there is enough regularity to identify preferences. Even if many of the findings are in line with general usability guidelines, it is important to realize that the needs of Deaf users differ somewhat from those of mainstream users. Even though Deaf people do not face as strong physical barriers in accessing content as blind and vision-impaired

Figure 23.4. The user interface of the Knack Web site gives visual feedback through color coding and animated icons.

people do, there are mental barriers that may be as limiting. For example, replacing audio content with writing is not enough: a lack of confidence in writing skills may prevent people from taking part in text-based discussion forums, an inability to use one's mother tongue may cause frustration, and unclear guidance may prevent people from using the site. Additionally, this study has demonstrated that the style in which information is told is important to Deaf users: it determined whether they were engaged and willing to explore the content of the site.

Some of the findings may also apply to hearing people; thus, they should be treated not as a list of differences but simply as a list of issues to be considered when designing for the Deaf community. This "from minority to mainstream" thinking also implies that Deaf people—whose language is visuospatial, based on gestures and movements—are more sensitive to visual elements than hearing people. The design research suggests that the visual features of an interface may be even more important for sign-language users than for mainstream users. Consequently, Deaf people have a smaller tolerance for visual clutter and discontinuity in design.[39] Knowing this may also bring a new perspective to designing for other user groups, such as for elderly and dyslexic users, who are visually oriented because of their short-term verbal memory.

The Knack project demonstrated that an unduly narrow focus on accessibility has undermined user experience. In other words, the term *accessible,* in this case collocated with a Web site, has been diverted to mean something unexpected: added visual aesthetics and moving images, on the one hand, and partially text-based information, on the other hand, even for dyslexic sign-language users, because signed information may not always be optimally memorized. The collaborative activity of Knack brought about new perspectives in accessible Web design. For Web designers, Deaf Gain means that accessible portals should not automatically contain "boring, stripped-down information" with no images and movement, as they are today. The results of the Knack project might lead to another perspective, more fragmented but much more user-oriented than the current perspective.

Discussion: From Deaf Participation to Deaf Gain?

Despite the design challenge of creating accessible user interfaces, the needs and requirements of inclusive education have been theoretically examined,[40] and technology needed for its practical implementation is already available. Both projects—CinemaSense and Knack—were produced through co-design. CinemaSense supports the flexible study of film production but also represents edutainment, regardless of whether people have serious learning aims or not. The iterative collaboration with Deaf students revealed how the accessibility of communication tools and technology is indeed the issue for effective collaboration.[41] Evidence concerning the productivity of the project, indicating that a great deal of personal and collective learning took place, shows that CinemaSense serves various communities using spoken or signed language that are studying film art across the world.

Simultaneously, CinemaSense and Knack aimed at creating a set of visual Web-based study material. CinemaSense helps in understanding film as a product of cultural—even transcultural—activity. In the case of Knack, the material offered information about visual rhythm based on studies proving that disorders in the perception of rhythm are linked with difficulties in learning. Like CinemaSense, the Knack project included three design cycles: contextual inquiry, identification, and integration of culture-specific features. In the Knack project, the challenge

was set to design an interface that would meet the real needs of Deaf users. The purpose of this design study was, first, to identify affordances that convey the Deaf way of doing, seeing, and representing;[42] and second, to embed these into design features that Deaf users find engaging. The pilot Web site was a hypothesis of the kind of interface that would bring enjoyable reading experiences to members of the Deaf community based on their ideas developed in workshops. The prototype is a design outcome that the participants found engaging as well as easy to use and understand.

The results of the co-design projects are closely tied to the opinions of Deaf users. We are not capable of examining each embedded feature in depth, because of the limited space in this chapter. In addition, there may be several issues that the studies have not touched upon; the co-design methodology relies solely on participants to raise the issues they are concerned with, like the issue of Deaf Gain. Nevertheless, agendas set by members of the culture are ones that they are concerned with and that are thus important to them. Therefore, it can be assumed that these are the issues that contribute to an interface that may become cherished by Deaf users.

The recent rise of educational affordances has shown the need to collaborate toward data-based Deaf research that would enhance our understanding about the Deaf Gain in diverse educational, social, and linguistic contexts. The theories about deafness have traditionally been based on somewhat vague methods using a predicate framework;[43] they ignore how an active learner or an actor in any given community organizes and perceives the world. Quite often, the basic assumption behind research designs tends to anticipate that the world consists merely of objects, events, and relationships. Moreover, researchers tend to presume that a language equals speech and the conceptual structures of a language reflect rather straightforwardly the ontological structures of the world. This might lead one to comprehend learning as a means of memorizing the mapping from the epistemological domain (including concepts, terms, words, and signs) onto the ontological domain (objects, events, and relationships), although more adequate theories could be used in modern education.

We propose that co-design can be applied in the production of multimodal Web services that, for their own part, promote inclusion as well as give space to possible Deaf Gain. The journey toward expertise progresses through a convenient apportioning of novel requirements. Equal, flexible, and accessible network communication is a good way of learning about both the majority and the minority cultures and corresponding expert practices by following one's own rate of appropriating knowledge. Through co-design, we can access the tacit knowledge of Deaf users that would not otherwise be tapped as an influential factor in the process of designing comfortable user experiences for sign-language users in particular, and accessible sites and learning environments in general.

Finally, the aim of the outcome is to generate intermediate concepts and solutions that may be used in other settings as tools in the design of locally appropriate new solutions. Hence, as researchers and practitioners, we clearly need to consider mode-2 models that advocate more contextual, situated, and nuanced understandings about the meaning of Deaf Gain in design activity. This in turn would galvanize collaborating developers to improve tools for knowledge building in the diverse communities of societies.

Conclusions

We are convinced that it is essential to understand how Deaf students, as visually oriented people, conceive of learning, knowing, and collaboration in order to promote efficient approaches to learning and tuition in all levels of education. Raike revealed that the accessibility of communication tools and technology is indeed the issue for effective collaboration.[44] Moreover, Kitunen claims that, in addition to accessibility, the design process needs to understand the cultural needs of Deaf users that cover both visual and functional aspects of such tools.[45] This understanding in turn raises questions of agency in the design process itself, such as why an activity has been launched and what the purpose of knowledge building in the activity is. In practice, the Deaf Gain is related here more to collaborative knowledge building taking place in a community, possibly as a co-design project to create a novel artifact or to innovate existing products.

We should consider that rather than just creating products, contemporary designers working in information-technology-related areas also participate in hybrid networks of mind and matter.[46] Within such networks, the activity of design involves the orientation of situated practices within the existing communities of practice, such as Deaf students, graduates, and (mainly) hearing employers and professional peers. The aim of a co-design project is typically to refocus the diverse objects of activity within such practices toward shared outcomes, producing communal artifacts like a Web site for inclusive higher education. By involving Deaf users in the design process, we can produce better digital environments through creating visual approaches to designing interfaces and providing new tools, such as video-based discussion forums that advance the user experience of many other user groups, such as dyslexic students and visual learners.

Obviously, the issue is not so simple, and actors in education should consider the role of learners' activity in knowledge building as an essential part of developing Deaf Gain. Hence, actors need to be concerned about the possible benefits of conceptualization in the Deaf way, given the importance of divergent thinking for creative tasks. This in turn augments Deaf professionals' abilities to interpret and evaluate any information and to make decisions vis-à-vis the multifaceted problems of the world.

Notes

1. Antti Raike, "The Global Net and the Deaf Self: Deaf People and the Experience of Information and Communication Technologies," in *Looking Forward: EUD in the Third Millennium; The Deaf Citizen in the Twenty-First Century,* ed. Lorraine Leeson (Coleford, UK: Douglas McLean, 2001), 89–99.
2. Kai P. J. Hakkarainen et al., *Communities of Networked Expertise: Professional and Educational Perspectives* (Amsterdam: Elsevier, 2004).
3. H-Dirksen L. Bauman and Joseph J. Murray, "Deaf Studies in the Twenty-First Century: 'Deaf Gain' and the Future of Human Diversity," in *The Oxford Handbook of Deaf Studies, Language, and Education* (Oxford: Oxford University Press, 2010), 2:210–25.
4. Michael Gibbons et al., *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies* (London: Sage, 1994). *Transdisciplinarity* denotes a research strategy that crosses disciplinary boundaries to create a holistic approach. Transdisciplinary research tends to focus on an issue itself, compared with multidisciplinary or interdisciplinary inquiry, which may focus on the contribution of disciplines to an inquiry. For example, a transdisciplinary approach in Deaf studies involves multiple disciplines and the spaces between and beyond the disciplines, with the possibility that those spaces may produce novel perspectives.
5. Kari Kuutti, "Design Research, Disciplines, and the New Production of Knowledge" (paper presented at the International Association of Societies for Design Research IASDR07 Conference, "Emerging Trends in Design Research," Hong Kong, 2007), accessed January 23, 2013, http://www.sd.polyu.edu.hk/.
6. Heinz Mandl, Hans Grüber, and Alexander Renkl, "Communities of Practice toward Expertise: Social Foundation of University Instruction," in *Interactive Minds: Life-Span Perspectives on the Social Foundation of Cognition,* ed. Paul B. Baltes and Ursula M. Staudinger (Cambridge: Cambridge University Press, 1996), 394–412.
7. Jean Lave and Étienne Wenger, *Situated Learning: Legitimate Peripheral Participation* (Cambridge: Cambridge University Press, 1991).
8. Anita Williams Woolley et al., "Evidence for a Collective Intelligence Factor in the Performance of Human Groups," *Science* 330 (2010): 686–88.
9. Suvi Kitunen (Pylvänen), "Designing a Deaf Culture Specific Web Site: Participatory Design Research for Knack.fi" (master's thesis, University of Art and Design Helsinki, 2009); Antti Teittinen, *Vammaisuuden tutkimus* [Disability Research] (Helsinki: Yliopistopaino, 2006).
10. Thomas Suddendorf and Claire M. Fletcher-Flinn, "Theory of Mind and the Origins of Divergent Thinking," *Journal of Creative Behavior* 31 (1997): 169–79, doi:10.1002/j.2162-6057.1997.tb00789.x.
11. Yrjö Engeström, "From Design Experiments to Formative Interventions," *Theory and Psychology* 21, no. 5 (2011): 598–628, doi:10.1177/0959354311419252.
12. Graham Pullin, *Design Meets Disability* (Cambridge, Mass.: MIT Press, 2009).
13. Simeon L. Keates and P. John Clarkson, *Countering Design Exclusion: An Introduction to Inclusive Design* (Berlin: Springer, 2003); Victor Papanek, *Design for Human Scale* (New York: Van Nostrand Reinhold, 1983).
14. Kevin Carey, "Accessibility: The Current Situation and New Directions," *Ariadne,* no. 44 (2005), accessed January 23, 2013, http://www.ariadne.ac.uk/issue44/carey.
15. This importance of emotion and noninstrumental needs without clear and precise goals has been referred to using a number of terms, including "pleasure-based approach" (Patrick W. Jordan, *Designing Pleasurable Products* [London: Taylor & Francis, 2000]), "empathic design" (Katja Battarbee, Ilpo Koskinen, and Tuuli Mattelmäki, *Empathic Design: User Experience in Product Design* [Helsinki: IT Press, 2003]), and "emotional design" (Donald A. Norman, *Emotional Design: Why We Love (or Hate) Everyday Things* [New York: Basic Books, 2004]).

16. Klaus Krippendorff, *The Semantic Turn: A New Foundation for Design* (Boca Raton, Fla.: CRS Press, 2006).
17. Richie Moalosi, "The Impact of Socio-cultural Factors upon Human-Centred Design in Botswana" (doctoral diss., Queensland University of Technology, 2007), accessed January 23, 2013, http://eprints.qut.edu.au/16353/.
18. Antti Raike, "Löytäjät elokuvantajua rakentamassa: Yhteisöllinen WWW-palvelun tuotanto" [Finders Building CinemaSense: Production of Collaborative WWW Service] (doctoral diss., University of Art and Design, Helsinki, 2005). Raike is also a professional filmmaker and a sign-language user.
19. Kitunen [Pylvänen], "Designing a Deaf Culture Specific Web Site."
20. Antti Raike and Timo Honkela, "Neural Network Analysis Method for Supporting Deaf Students in Distance Learning" (paper presented at the Commission on Technology at the 14th World Congress of the World Federation of the Deaf, July 18–26, 2003, Montreal, Quebec); Antti Raike, "Searching Knowledge: CinemaSense as a Case Study in Collaborative Production of a WWW Service in Two Universities," in *Computers Helping People with Special Needs,* ed. Klaus Miesenberger et al. (Berlin: Springer, 2006), 568–74; Timo Honkela et al., "Self-Organizing Maps and Constructive Learning," in *Proceedings of Conference on Educational Uses of Information and Communications Technologies, Sixteenth IFIP World Computer Congress: Beijing, China, August 2000,* ed. D.H. Benzie and D. Passey (Beijing: Publishing House of Electronics Industry [PHEI], 2000), 339–43, http://citeseerx.ist.psu.edu/; Antti Raike and Kai Hakkarainen, "Concept Maps in the Design of an Accessible CinemaSense Service," *Art, Design, and Communication in Higher Education* 8, no. 1 (September 2009): 27–55, doi: 10.1386/adch.8.1.27_1.
21. Antti Raike, "Hypermedia and the Sense of Cinematic Expression" (paper presented at the Commission of Technology, 13th World Congress of the World Federation of the Deaf, Brisbane, Australia, 1999); Antti Raike, "Elokuvantaju-CinemaSense: A Collaborative Distance Learning Solution for Cinema Studies" (poster paper presented at Deaf Way II conference, July 11, 2002, Washington, D.C.).
22. Bauman and Murray, "Deaf Studies in the Twenty-First Century," 218.
23. Antti Raike, Karri Laitinen, and Timo Viikari, eds., "Elokuvantaju-CinemaSense," Aalto University, accessed January 23, 2013, http://elokuvantaju.aalto.fi/.
24. H-Dirksen L. Bauman and Joseph J. Murray, "Reframing: From Hearing Loss to Deaf Gain," *Deaf Studies Digital Journal,* no. 1 (2009), accessed January 23, 2013, http://dsdj.gallaudet.edu/.
25. The Finnish signer of CinemaSense was a Deaf art student from Aalto ARTS. Translations from Finnish into FinSL were made in collaboration with the Finnish Deaf Association and a professional Deaf videographer.
26. Antti Raike, Hector Botero, and Stefen Rodríguez, "Aprendiendo Expresión Cinematográfica, Construyendo Conocimientos para el Desarrollo de las Comunidades de Sordos" [Learning Film Expression, Building Knowledge for Development of the Deaf Community] (paper presented at the Simposio Virtual Somece 2003, Sociedad Mexicana de Computación en la Educación, Somece, Mexico, 2003), accessed January 23, 2013, http://www.academia.edu/.
27. The Spanish and Colombian Sign Language translations were made in collaboration with Colombian Deaf and hearing media professionals: Federación Nacional de Sordos de Colombia (FENASCOL) and Kimera (Debogar and Cia).
28. Keates and Clarkson, *Countering Design Exclusion.*
29. Raike, "Löytäjät elokuvantajua rakentamassa."
30. Joan Greenbaum and Morten Kyng, eds., *Design at Work: Cooperative Design of Computer Systems* (Hillsdale, N.J.: Erlbaum, 1992); Yrjö Engeström and David Middleton, eds., *Cognition and Communication at Work* (Cambridge: Cambridge University Press, 1999).

31. The students were from the Classroom Teacher Training Programme for Finnish Sign Language Users of Jyväskylä University, Finland.
32. Raike, "Löytäjät elokuvantajua rakentamassa."
33. Antti Raike et al., "CinemaSense Portal and Neural Network Analysis Method for Supporting Students of Linguistic Minorities in Distance Learning" (paper presented at Cumulus Working Papers, Tallinn, Estonia, 2003).
34. Roger C. Schank, *Dynamic Memory Revisited* (New York: Cambridge University Press, 1999).
35. Lave and Wenger, *Situated Learning.*
36. Hakkarainen et al., *Communities of Networked Expertise.*
37. Päivi Rainò, *Osata-projekti 2007–2009: Loppuraportti* [Osata Project, 2007–2009: Final Report] (Helsinki: Finnish Association of the Deaf, 2010).
38. Katie Overy, "Classroom Rhythm Games for Literacy Support," in *Music and Dyslexia: A Positive Approach,* ed. T. Miles, J. Westcombe, and D. Ditchfield (Chichester, UK: Wiley, 2009), doi:10.1002/9780470988183.ch4.
39. Ruth Rosenholtz, Yuanzhen Li, and Lisa Nakano, "Measuring Visual Clutter," *Journal of Vision* 7, no. 2 (2007): 1–22, doi:10.1167/7.2.17.
40. Mike Adams and Sally Brown, eds., *Towards Inclusive Learning in Higher Education: Developing Curricula for Disabled Students* (New York: Routledge, 2006); Sheila Riddell, Teresa Tinklin, and Alastair Wilson, *Disabled Students in Higher Education: Perspectives on Widening Access and Changing Policy* (New York: Routledge, 2005); Jane K. Seale, *E-Learning and Disability in Higher Education: Accessibility Research and Practice* (London: Routledge, 2006).
41. Woolley et al., "Evidence for a Collective Intelligence Factor in the Performance of Human Groups."
42. "Perceived affordance" is the quality of an object that suggests how it might be used.
43. For example, the sentences "Fred is disabled," "A deaf student is disabled," and "The student in special education is disabled" come from placing a noun or a noun phrase in front of the template "is disabled." The phrase "is disabled" is a predicate indicating the property of being disabled. However, the predicate could be anything: "is creative," for example. A framework could be, for example, a system used to describe levels of educational qualifications in a society.
44. Raike, "Löytäjät elokuvantajua rakentamassa"; Raike and Hakkarainen, "Concept Maps in the Design of an Accessible CinemaSense Service."
45. Kitunen (Pylvänen), "Designing a Deaf Culture Specific Web Site."
46. Pelle Ehn and Richard Badham, "Participatory Design and the Collective Designer," in *PDC 02: Proceedings of the Participatory Design Conference, Malmö, Sweden, 23–25 June 2002,* ed. T. Binder, J. Gregory, and I. Wagner (Palo Alto, Calif.: CPSR, 2002): 1–10, accessed January 23, 2013, http://ojs.ruc.dk/index.php/pdc/article/view/235/227.

24

THE HEARING LINE

How Literature Gains from Deaf People

CHRISTOPHER KRENTZ

What do we call the invisible gap that exists between deaf and hearing people? In my book *Writing Deafness* (2007), I proposed the phrase "the hearing line" (signed HEAR LINE), which may seem awkward at first.[1] I intended to parallel W. E. B. Du Bois's famous metaphor of the color line, which he used to describe the division that separates white and black people in the United States. "The problem of the Twentieth Century is the problem of the color line," Du Bois proclaims at the start of his book *The Souls of Black Folk* (1903), effectively calling on people to confront the role of race and racism in society.[2] His color-line image proved widely influential. The book justified African Americans' pursuit of higher education, celebrated the beauty of African American spirituals, and helped to lay the intellectual foundation for the black freedom struggle.[3] Du Bois extended the color line to describe the relationship of whites and people of color around the globe. Similarly, the hearing line applies whenever hearing and deaf people come into contact, whatever their race, gender, class, or geographic location. Throughout history, deaf people of all ethnicities have experienced a substantial divide from the hearing majority. The problem of how deaf and hearing people should relate to each other, we could say, is the problem of the hearing line.

Like the color line, the hearing line could productively be applied to a variety of disciplines, but it proves especially illuminating when we consider literature.[4] In this chapter, I focus on how the presence of deaf people adds depth and richness to American writing in the nineteenth century. The rise of deaf education during this period made deaf people much more visible in American society. It allowed them to come together as a group (given that most deaf people had hearing families and lived in agrarian regions, they were usually isolated from each other), develop their own elegant sign language, and learn to read and write English in greater numbers. Through their written works, deaf and hearing authors explored their similarities and differences. In the process, they produced remarkable literature.

The hearing line helps us to identify a fascinating literary corpus (fiction, poetry, essays, and lectures by deaf people) that, until recently, largely escaped sustained attention. Like other minority writers, deaf authors such as Laurent Clerc and John Burnet often produced a resistance literature that contests dominant ideologies. They sought to write themselves out of their marginalized status, to prove their capabilities and humanity to the majority, and to achieve a measure of public understanding and influence. By reading deaf writing carefully, we gain greater understanding of the minority experience in the United States.

At the same time, the hearing line calls attention to a previously unacknowledged element of our most familiar and acclaimed literary works: that they are written by *hearing* people. Today, we almost automatically note authors' race and gender, but their audiological status rarely receives thought, because to be hearing is the unquestioned norm. Even the label of "hearing" may be unfamiliar to most hearing people until they encounter a deaf person. During the nineteenth century, hearing authors such as Herman Melville and Mark Twain worked deafness and deaf people into their literary masterpieces, making their fiction even more complex, democratic, and relevant. They typically used deafness to define not just deaf others but also themselves (as competent and rational), helping to form a self-consciously hearing identity.

In these respects, the presence of deaf people enhances our literature. Now, in the twenty-first century, it can be easy to underestimate the importance that literary representations had and continue to have in shaping public opinion, civil rights, and the fates of communities. Through writing, authors challenge or reinforce power arrangements. The discourse concerning the hearing line is consequential, like writing about the color line or about the relationship between men and women, colonizers and colonized, straight and gay, able-bodied and disabled, or any other dominant and subordinate group. The hearing line allows us to consider how deaf people relate to other disempowered groups and holds out the possibility for increased understanding and political alliances across identities, time, and place. Yet it also helps us to attend to significant distinctions and to realize how deaf people of all backgrounds challenge and modify existing knowledge about difference. Far from being a marginal concern or curiosity, writing about the hearing line goes to the heart of what it means to be human. This aspect of literature should be recognized, explored, and celebrated, not bypassed.

Theorizing the Hearing Line

Some readers may object that the hearing line creates yet another reductive binary opposition, assigning people to two opposing categories and ignoring the complexities therein. They would have a point. It seems humans have a mental need to classify and label, even if those generalizations are often not strictly accurate. We should remember that Du Bois obscured a vast array of racial identities with his

color line, reducing them simply to white and nonwhite. He was justified in doing so, I would argue, because that was how the majority often thought about race in his time, as the so-called one-drop rule suggests.

The language people use to describe auditory status has often masked a more complicated truth. During the first part of the nineteenth century in the United States, the common phrase for people who did not hear was "deaf and dumb"; by midcentury, "deaf-mute" had come into favor; and by the end of the century, as oralists insisted that all deaf people had the ability to speak, just "deaf" was dominant. The reality was more complicated. Today we know that most "deaf" people have some residual hearing (just 10 percent of deaf people hear nothing at all). Whereas some deaf people were born deaf, many others lost their hearing later, after they had heard sound and perhaps learned spoken English. Some "deaf and dumb" people could use their voices effectively, if only to speak a word or to call for a hearing person's attention. Nineteenth-century people occasionally attempted to use liminal terms like "semideaf" or "semimute" in an attempt to rectify such inaccuracies, with limited success. Moreover, some "hearing" people had progressive hearing loss, were tone deaf, experienced temporary deafness, or had a hearing loss on certain frequencies. When we recall that some deaf people successfully passed as hearing and that a few hearing people signed as fluently as their deaf counterparts, we further see how the division of humans into "deaf" and "hearing" obscures a wide assortment of identities that may be rather fluid. The binary does not do justice to this more unstable reality, yet in the nineteenth century, as today, people routinely use absolute labels. I turn to the hearing line not to reify fantasies of absolute division but because it usefully expresses the way many people think about deafness.

The hearing line draws on both biological and cultural notions of difference. Deafness and its opposite, what I call "hearingness," do, of course, have a biological component. During the nineteenth century, some hearing people, like Edward Miner Gallaudet, signed well and supported deaf causes, attaining special stature in the deaf community. However, they were never "deaf." Similarly, gifted deaf lipreaders who associated with hearing people, like Alexander Graham Bell's wife, Mabel Hubbard Bell, were never "hearing." The biological difference always remained. It serves as a stubborn reminder of the importance of bodily variation to who we are.

Yet the significance of the hearing line is also shaped by the historical moment, culture, and context. Because deafness is invisible—deaf and hearing people look the same, after all—the hearing line often appears unexpectedly through behavior, when a person does or does not react to sound or communicates in a specific manner. Time and place make a big difference. As Douglas Baynton has shown, the Christian evangelical-reform movement helped to support the rise of deaf education that used sign language in the United States before the Civil War.

However, later in the nineteenth century, with the spread of evolutionary thinking and an emphasis on assimilation, oralism (a method stressing vocal speech and speechreading in place of signing) became the dominant educational method.[5] What it means to be deaf in the United States in the twenty-first century, when deaf people have access to education, a thriving community, professional sign-language interpreters, videophones, and civil rights laws, differs significantly from what it means in a developing country where deaf people might not have access to those things. Furthermore, deaf members of "signing villages," like that in a remote Bedouin community in Israel, have a more positive communal experience than isolated deaf persons elsewhere.[6] The hearing line is not stable but must perpetually be retested and reimagined. Endlessly elusive, it reveals a complex and shifting relationship between physical difference, culture, and identity, which has implications for larger contemporary debates over the formation of the self.

A Deaf Resistance Literature

In 1816 in Philadelphia, a group of civic leaders gathered to see what many of them had never before encountered: an educated deaf person. Laurent Clerc, a thirty-year-old deaf man, had recently arrived from France and was traveling to help raise funds for the establishment of the first permanent school for deaf students in the United States. After a colleague read aloud a short speech Clerc had written, a hearing audience member asked Clerc how he knew whether he thought in the same way as people who could hear. The question was conveyed to Clerc, who moved to a chalkboard to reply. "I can express my own ideas by writing," he wrote, "and as what I write is what you speak, I can judge that I possess the same faculties in mind as you do."[7] Through writing, Clerc was able to demonstrate his intelligence and humanity to the majority. Suddenly, deaf people had a voice in American public discourse.

To say a "deaf and dumb" person has a voice may seem contradictory, but as Carol Padden and Tom Humphries point out, "voice" has dual meaning: it may signify not just talking with the mouth, larynx, and tongue but also *being heard,* no matter what the mode of communication.[8] Many minority groups have achieved a public voice through writing, but deaf people like Clerc were the only ones who also did not speak vocally at all. Writing allowed them to bypass spoken language and attempt to challenge the long-held popular association of speech with intelligence. Through the silent, visual space of the text, they could express themselves to hearing people and try to overcome the boundary of the hearing line.

The most prominent deaf person in antebellum America, Laurent Clerc proved an eloquent writer on behalf of deaf education, sign language, and deaf potential. With Thomas Hopkins Gallaudet, a hearing Congregationalist minister, and Mason Cogswell, a hearing father of a deaf girl, he succeeded in cofounding a school for deaf students in Hartford, Connecticut, in 1817, and taught there for four de-

cades. In what we could call an early example of multiculturalism, in an address he wrote for the Connecticut legislature in 1818, Clerc made deaf people appear a part of natural variation rather than a mark of almost unfathomable deviance:

> Every creature, every work of God, is admirably well made; but if any one appears imperfect in our eyes, it does not belong to us to criticize it. Perhaps that which we do not find right in its kind, turns to our advantage, without our being able to perceive it. . . . Let us, in thought, go into an orchard or forest. What do we see? Trees high or low, large or small, upright or crooked, fruitful or unfruitful. Let us look at the birds of the air, and at the fishes of the sea, nothing resembles another thing. . . . Why then are we Deaf and Dumb? I do not know, as you do not know why there are infirmities in your bodies, nor why there are among the human kind, white, black, red and yellow men. . . . I think our deafness proceeds from an act of Providence, I would say, from the will of God, and does it imply that the Deaf and Dumb are worse than other men?[9]

Clerc stresses the naturalness of deafness and gives a reason for deaf people's existence; they are not an oddity or irrationalism, not evil, but part of the natural diversity in divine creation. He even has the boldness to suggest that deaf people are equal to their hearing counterparts. Only God has the power to judge. Challenging centuries of received wisdom that has routinely assumed deaf people are inferior or even malevolent beings, Clerc instead argues for humble tolerance of diversity. By putting deafness alongside variation in skin color, he implicitly condemns prejudice against black people, Native Americans, and others based on race. By putting deafness alongside "infirmities," he makes a radical claim for the absolute value of every kind of human variation, including disability (an assertion that fits in with the goals of much disability advocacy and scholarship today). Clerc thus participates in the gradual destabilizing of white hearing hegemonic self-assurance and sets the stage for other minority writers, including the Native American William Apess and the African American Frederick Douglass, in the decades ahead.

In the following years, other deaf authors followed Clerc's lead, celebrating the worth of the deaf community and decrying prejudice. For example, in 1835, John Burnet published *Tales of the Deaf and Dumb,* a collection of essays, poems, and a story about deaf people that (he explained in an afterword) he hoped would "awaken . . . an interest on the subject in the bosoms of many."[10] Burnet writes to the public with a firm and occasionally outraged voice. While acknowledging that some progress had been made, in a hortatory essay he castigates those who still believed that uneducated deaf people "display the characteristics . . . of *apes* or *monkeys*" and insists that deaf people are the same as other humans, except that

they need to communicate through the eye rather than the ear.[11] In his fiction and poetry, he praises the beauty of the language of signs and the deaf community, something he had discovered himself at age twenty-one, when he first visited the New York Institution for the Instruction of the Deaf and Dumb in New York City. Here's how Burnet describes a school for deaf students, presenting a jubilant account of community and connection in a longer poem, "Emma":

> I see an hundred of the deaf and dumb,—
> Collected from full many a distant home,—
> Within this noble pile,—whose walls—to them
> Open'd another world,—a fairy realm;
> A realm of a new language,—all their own,
> Where mind was visible,—and knowledge shone . . .
> *Here,* from the speaking limbs, and face divine,
> At nature's bidding, thoughts and feelings shine,
> That in thin air no more her sense elude,—
> Each understands,—by each is understood.
> Here can each feeling gush forth, unrepressed,
> To mix with feelings of a kindred breast.[12]

Skillfully evoking the headiness of sign language and deaf culture, Burnet gives a sense of the liberation and self-discovery that many deaf students experienced at residential schools. With "I see," he calls attention to vision, emphasizing visual language rather than the lack of hearing. His reference to nature underscores the naturalness of deaf people conversing through sign language. With the poem and the entire collection, Burnet expands upon Clerc's advocacy to offer a new vision of deaf experience in print, one that illustrates why most educated deaf Americans cared deeply about their language, community, and schools.

Living in a society that offered them few opportunities, some deaf writers unsurprisingly presented more negative views of their condition. Adele Jewel, a deaf woman who had to leave the Michigan school for deaf students because of health troubles, went through a painful divorce, and was impoverished, wrote an autobiographical pamphlet in an attempt to earn money. In it, she looks forward to becoming hearing in heaven, where she writes that "All will be right . . . no aching heart, no saddened countenance."[13] Given her difficult circumstances, her attitude makes sense: she undoubtedly had a harder life because she was deaf, and it was customary to anticipate all worldly woes being removed in heaven.

Even some of the most accomplished deaf people in nineteenth-century America had mixed feelings about their deaf identity. John Carlin was a successful deaf artist, writer, and lecturer who used sign language, married a deaf woman, and worked assiduously for the benefit of the deaf community. Yet at times he showed disdain for deaf people and sign, displaying what Du Bois would call "double-

consciousness," that sense of internal division and "two-ness" that seems to characterize so many groups of people who live in a society that views them as inferior.[14] These attitudes show up in Carlin's best-known poem, "The Mute's Lament," which begins,

> I move—a silent exile on this earth;
> As in his dreary cell one doomed for life,
> My tongue is mute, and closed ear heedeth not;
> No gleam of hope this darken'd mind assures
> That the blest power of speech shall e'er be known.[15]

Carlin depicts himself as a miserable outcast, reflecting not just the disconnection he felt from the hearing people around him but also a certain fashionable Byronic alienation. Unlike Burnet, he omits sign language and any hint of the deaf community, presenting himself as a lonely deaf "I." He appears to have internalized the negative assumptions that hearing people often have about deaf people. Yet the poem can be read in another way, too, for Carlin clearly does not have a "darken'd mind"; through the poem, he manages to display keen intelligence. If his "tongue is mute," he still manages to communicate effectively with hearing readers through the written word. In paradoxical fashion, Carlin thus simultaneously affirms and questions dominant hearing ideology, vividly illustrating his own double-consciousness about his deaf self in the process.

So far, the deaf authors I have considered direct their work mostly at hearing readers, but deaf people separated by time and place wrote to each other, too, of course. The most intriguing glimpse we have inside the deaf community before the Civil War came in the 1850s, when a deaf man in Georgia named John J. Flournoy proposed that deaf people form their own state in the West where they could escape prejudice and manage their own affairs. In a letter published by the *American Annals of the Deaf and Dumb,* a journal dedicated to deaf education and deaf issues, in 1856, he lambasted the discrimination against deaf people he perceived around him. "We do attest that we are capable," he wrote. "The old cry about the incapacity of men's minds from physical disabilities, I think it were time, now in this intelligent age, to *explode!*"[16] Thus began an animated written debate. A variety of deaf men (they were all white men) responded with their views, some criticizing the plan, a few supporting it, and some suggesting a smaller compromise. Flournoy's idea ultimately was rejected. But, like African Americans at the first National Negro Convention in Philadelphia, in 1830, who discussed whether free blacks should emigrate to Canada to escape white discrimination, deaf writers seriously debated how they could best respond to hearing prejudice and find a place where they felt valued.

Taken together, such deaf writing adds to the range of minority literature in the United States. These authors conclusively demonstrate their intelligence, hu-

manity, and capability to readers. Alternatively celebrating their identities and confirming the difficulties of the hearing line, their writing reveals another valuable aspect of human experience.

The Powers of Deafness: Hearing Authors

What happens when hearing authors take on the hearing line? Following Toni Morrison's influential idea of an "Africanist presence" in literature by white authors, I contend that we can detect a "deaf presence" in hearing writers' works that reflects a range of perspectives, anxieties, and assumptions about deaf people.[17] One aspect of this deaf presence is authors' use of deaf characters and even of hearing characters who act deaf, which I will discuss presently. But we can also discern the deaf presence more subtly in the manner authors use sound, silence, gesture, and deaf-related metaphors. Taken together, these aspects shape the meaning of deafness, deaf people, and the hearing line in these works, and in the process they shore up hearing authors' own identity as hearing, speaking people.

Let us begin by considering how one of the greatest novels in American literature, Herman Melville's *Moby-Dick* (1851), is structured around an elusive deaf presence that usually remains outside the reach of human comprehension. Early in the novel, the whaling ship's captain, Ahab, himself appears somewhat deaflike in his refusal to speak to others. "Not a word he spoke," we are told, "nor did his officers say aught to him."[18] People in the crew try to penetrate the silence through a variety of rumors about his legendary past and ghastly scar, but they never quite solve "the mystery in him" (89). In the pivotal scene on the quarterdeck, Ahab breaks out of this deaf aura. His hortatory address to the crew, with its impassioned call for pursuit of the white whale, unites him and the other people on board as speaking, hearing individuals. Interestingly, though, the deaf presence does not quite disappear. Ahab returns to moody silence throughout the book. More significantly, the deaf presence around Ahab proves a microcosm for the larger ways in which it envelops whales, God, fate, and the entire universe.

Throughout the novel, Melville describes whales, particularly the white whale, as essentially unknowable and beyond language, characteristics that he implicitly equates with deafness. By saying at one point that, "blind and deaf, the whale plunged forward," Ishmael makes the deaf presence explicit (421). Through the trope of deafness (and also blindness), he evokes not just the whale's obduracy but also its strangeness, its vast inscrutability. Ishmael reports "wild rumors" whose "wonderfulness and fearfulness" add to Moby Dick's fearfulness as sailors conjecture that the white whale is supernaturally powerful, intelligent, malicious, ubiquitous, or even immortal (195–96). Once again, people project their own desires and fears onto a silent, speechless deaf other.

To Ahab, the white whale seems to embody the secrets of the universe. He cannot tolerate the ambiguity of the whale. "The inscrutable thing is chiefly what I hate, and be the white whale agent, or be the white whale principal, I will wreak

that hate upon him," he declares (178). His monomaniacal quest appears to be not so much about revenge for his missing limb as about apprehending the incomprehensible nature of the world; he fears that there is "naught beyond," that aimless inscrutability is all he will ever discover (178). Yet, however foolish his mission, by insistently taking on the deaf presence, Ahab defines himself as a vital hearing person.

Both Ahab and the sailor who narrates the tale, Ishmael, come up empty in their endeavor to penetrate this deaf mystery. Ahab's obsessive desire to grasp the enigma of the whale becomes particularly evident when he implores the dead sperm-whale head, "Speak, mighty head, and tell us the secret thing that is in thee" (339). Yet of course, the head remains silent, impervious to speech. For his part, Ishmael brings all his knowledge to bear on whales, categorizing them and dissecting their various body parts and functions. Yet he repeatedly admits the impossibility of this quest to discover the mystery of whales. "This whole book is but a draught, nay, but the draught of a draught," he says (157). He tells us we cannot find out precisely what a whale looks like. The act of trying to write the whale wearies him, for no matter how much knowledge, how many words, he brings to the task, the whale lies beyond human understanding. In this way, the deaf presence in the novel lurks in the background and continually threatens to overwhelm the poised logocentrism of Ishmael's famous opening invitation to speech, "Call me."

Implicit in Ahab's quest for meaning and order is a search for some higher being, and the underlying fear seems to be that God is deaf, shut off from human prayers and suffering. Ahab longs for a world in which God is ever-present and loving, but instead Melville presents us with an indifferent divinity toward the end of *Moby-Dick*, when Ishmael describes a mute, deaf "weaver-god." "The weaver-god, he weaves; and by that weaving is he deafened, that he hears no mortal voice," he says (490). Deafness becomes a shorthand for humanity's existential condition, for its estrangement from a god who knows or cares. Ishmael goes on to suggest that the deafness is contagious: "by that humming we, too, who look on the loom are deafened." This impervious, unreasoning meaning of deafness reappears in the person of the carpenter, an automatonlike man who "did not seem to work so much by reason or instinct" as by "a kind of deaf and dumb, spontaneous literal process" (510). The carpenter, like the weaver-god, is "deaf" in that he does not think or feel: he is cut off from humanity.

Through his reams of verbal discourse, Melville effectively sets himself up as opposite to the silent, deaf other. He defines himself as a hearing, speaking, rational individual, albeit one preoccupied with the limits of human understanding. Other moments in *Moby-Dick* reveal a similar concern with knowledge and interpretation: the doubloon and Queequeg's tattoos, for example, are visible signs whose definite meaning no one can decipher. With the deaf presence, Melville neatly conveys this ineffable inscrutability, this sense of something at once

quite close to and quite far from rational comprehension. By organizing *Moby-Dick* around a beguiling, horrifying deaf presence that is never quite explained, Melville effectively positions deafness, and by extension deaf people, as outside language, unknowable, and Other.

Whereas the deaf presence shows up subtly in the figurative language of books like *Moby-Dick,* it appears more directly when it comes to hearing authors' depictions of deaf people. During the nineteenth century, sentimental literature was quite popular, and writers in this genre often presented deaf children as innocent and attractive. To cite one example, Lydia Huntley Sigourney was probably the most well known female poet in mid-nineteenth-century America (her affected style has made her less read today). She lived in Hartford, Connecticut, and sometimes visited the school for deaf students there. In "Prayers of the Deaf and Dumb" (1845), she describes deaf children in chapel. Although she initially laments their inability to voice prayers as hearing people do, she concludes by contending that connection with God does not require speech, which actually may impede it:

> The pomp of words may sometimes clog
> The ethereal spirit's flight,
> But in the silence of their souls
> Burns one long Sabbath light,—
> If God doth in that temple dwell,
> Their fancied loss is gain;
> Ye perfect listeners to His voice!
> Say, is our pity vain?[19]

Drawing on the religious tradition of silent meditation, Sigourney paradoxically suggests that the deaf worshippers are "perfect listeners," better hearers of God than hearing people distracted by speech. Adding to the irony is that Sigourney, a poet, questions the effectiveness of words even as her meter and rhyme schemes chug along. Her esteem romanticizes deaf people even as she uses their perceived difference to bring the normalized hearing identity into sharper focus.

In contrast to such sentimental depictions, hearing authors also sometimes used deaf characters to communicate horror. In these cases, deafness is typically shielded from view, emerging at the end as part of a tragic, gruesome surprise. In Ambrose Bierce's story "Chickamauga" (1889), a six-year-old boy wanders through a forest that turns out to be the site of a disastrous Civil War battle in Chickamauga, Tennessee. After a nap, he sees a hideous sight: scores of wounded soldiers crawling painfully toward a creek. However, the boy does not quite comprehend what they are. "Something in this," the narrator says, "something too, perhaps, in their grotesque attitudes and movements—reminded him of the painted clown who he had seen last summer in the circus, and he laughed as he watched them."[20] The garish contrast between the laughing boy and the dying men becomes even

more apparent as the boy takes the head of the procession. Happily waving his sword, he leads the macabre crew toward the water and a bright light in the distance. As the soldiers collapse and die near the creek, the boy approaches the light and suddenly realizes it is his home on fire. He discovers the body of a woman, presumably his mother, lying in a field, her brains leaking out from her shattered skull. Adding shock upon shock, Bierce concludes,

> The child moved his little hands, making wild, uncertain gestures. He uttered a series of inarticulate and indescribable cries—something between the chattering of an ape and the gobbling of a turkey—a startling, soulless, unholy sound, the language of a devil. The child was a deaf mute.
>
> Then he stood motionless, with quivering lips, looking down upon the wreck.[21]

The boy's "wild, uncertain gestures" (the sign language of a distraught deaf child?) and inarticulate cries contrast with the narrator's eloquent, assured voice. By comparing the boy's sounds to those of an ape or turkey, Bierce reifies the old interpretation of deaf people as animalistic, while his linkage of the boy's voice to a "soulless, unholy sound, the language of a devil" taps into the old interpretation of deafness as a mark of evil and sin. Finally, the boy's ignorance of the battle and obliviousness to the soldiers' pain reinforce stereotypes of deaf people's being dense and lacking in compassion. In a few sentences, Bierce manages to evoke almost all of the negative interpretations of deafness and casts the whole story in new light.

Bierce seems to adopt this approach not because he wants to present deaf people realistically but because he aims to show that Civil War generals were "deaf" to the pain and suffering caused by their actions. Throughout the story, the child inhabits the role of commanding officer, holding a pretend sword and leading the wounded soldiers. The boy's finding his home burning may be a metaphor for how the foolhardy Civil War leaders in effect burned Americans' home, turning some cities and sections of the country into desolated wasteland. Bierce employs deafness dramatically to convey the incompetence of Civil War leadership.

A final aspect of the deaf presence in this literature is the manner in which hearing characters act deaf. The empowering aspects of such performances become evident in William Craft's true account of fleeing slavery with his wife, Ellen, in *Running a Thousand Miles for Freedom* (1860). As the couple made their daring escape, in 1848, Ellen Craft engaged in what we might call quadruple passing to avoid detection: she crossed not just racial, gender, and class boundaries as she pretended to be a genteel white male slave owner, but also the hearing line. When an old friend of her master's boards the train she is on, she "resolved to feign deafness as the only means of self-defence" against his recognizing her voice.[22] She pretends to be blissfully unaware and unable to understand her inquisitor.

Her strategy succeeds, she and her husband elude capture, and her performance emerges as a way to escape oppression. It also gives the hearing line specific meaning: to be deaf, in Craft's performance, is to be ignorant and innocent.

That's not always the case. In *Adventures of Huckleberry Finn* (1885), Mark Twain makes his two scoundrels, the king and the duke, enact a comic parody of a deaf person in their efforts to trick gullible citizens out of a large inheritance. The duke's performance of deafness is as dramatic as it is absurd. "The duke . . . made all sorts of signs with his hands and said 'Goo-goo—goo-goo-goo,' all the time, like a baby that can't talk," Huck tells us.[23] We see the nonsense of the duke's "goos" even more clearly when he skips back and forth over the hearing line; he talks quietly to the king in private and at one point even sends the king a note correcting *his* speech. It is a brilliant twist, the seemingly deaf person correcting the hearing person's speaking ability, and one of several masterful touches in the whole exaggerated episode. Huck eventually helps to expose the confidence men as frauds, but their deaf performance, however funny, contains a threat: acting deaf allows them almost to take advantage of vulnerable people and to steal a lot of money. Significantly, Twain contrasts their charade with Jim's daughter 'Lizabeth, who, Jim earlier tells Huck, suddenly became deaf from scarlet fever at age four. Unlike the duke, 'Lizabeth is sweet, innocent, a "po' little thing" in Jim's heartfelt description—another example of a sentimental portrayal of a deaf person in this literature.[24]

As we have seen, in their exploration of the hearing line, nineteenth-century hearing authors sometimes express powerful attraction toward and fear of deaf people and deafness, use deafness as a source of comedy and pathos, and associate it with what is outside human language and understanding. Their treatment of deaf topics makes their work greater and more inclusive. However, they never quite present deaf people as ordinary people. In these texts, we never get to meet a confident deaf adult who uses sign language, like Laurent Clerc or John Burnet. We rarely get to see a group of deaf adults together. Even more striking, we do not witness meaningful communication or understanding between deaf and hearing characters. In hearing works, the hearing line is never erased, as the gap always exists and deaf characters frequently come out as either idealized or, more often, deficient. We have to turn to deaf authors to see just how knowledgeable and accomplished deaf Americans could be at the time and to get a fuller understanding of the invisible but often daunting hearing line.

If such acclaimed authors as Melville and Twain never quite present a strong deaf character, their inclusion of deaf themes shows them responding directly or indirectly to the presence of deaf people in American society and trying to work out the meaning of the hearing line. Such treatments of deafness make our founding works of literature even more profound and reflective of the diversity of human experience.

The Twentieth Century and Future

Considering the hearing line in nineteenth-century writing by deaf and hearing authors is only the beginning. We need more scholarship into how deaf topics show up in more recent literature to see how the relationship between deaf and hearing people has grown, regressed, and evolved. Deaf authors' works like Albert Ballin's *The Deaf Mute Howls* (1930), Douglas Bullard's *Islay* (1986), and Bernard Bragg's *Lessons in Laughter* (1989) deserve serious study, especially alongside such hearing writers' fiction as Carson McCullers's *The Heart Is a Lonely Hunter* (1940), Flannery O'Connor's "The Life You Save May Be Your Own" (1953), and T. C. Boyle's *Talk Talk* (2006). In recent years, quite a few valuable anthologies of deaf writing have been published, bringing even more deaf authors to public attention, including deaf black writers like Kristi Meriweather and Nigerian playwright Sotonwa Opeoluwa.[25] What do such works reveal about the shifting role of deaf people in hearing society, or about the intersection of the color and hearing lines?

The hearing line also applies to other fields. We could easily include drama, juxtaposing plays by the National Theatre of the Deaf, Willy Conley, and Donald Bangs with such hearing playwrights' works as Elmer Harris's *Johnny Belinda* (1940), William Gibson's *The Miracle Worker* (1959), Mark Medoff's *Children of a Lesser God* (1982), and Stephen Sachs's *Sweet Nothing in My Ear* (1999). I have not mentioned poetry and storytelling in signed languages, but that is another compelling literary tradition related to the hearing line. Works by such accomplished deaf American Sign Language (ASL) performers as Ella Mae Lentz, Clayton Valli, Ben Bahan, Sam Supalla, Nathie Marbury, the Flying Words Project, and many others are now increasingly available on video and challenge us to rethink our assumptions about poetry and literature itself.[26] Film studies, too, would benefit from an exploration of the hearing line, putting films by such deaf directors as Ernest Marshall and Wayne Betts alongside hearing directors' efforts, including Stephen Herek's *Mr. Holland's Opus* (1995) and Caroline Link's *Beyond Silence* (1996). It is hard to think of an area of human inquiry, from history to public policy to linguistics to psychology, that does not relate to and benefit from looking at the hearing line, because deaf people of all backgrounds have enriched our society and culture in numerous areas. Such diversity and achievement should be valued.

Notes

1. Christopher Krentz, *Writing Deafness: The Hearing Line in Nineteenth-Century American Literature* (Chapel Hill: University of North Carolina Press, 2007).
2. W. E. B. Du Bois, *The Souls of Black Folk* (1903; repr., New York: Norton, 1999), 1.
3. Manning Marable, *Living Black History: How Reimagining the African-Americans Past Can Remake America's Racial Future* (New York: Basic Civitas, 2006), 96.

4. For an excellent example of the literary scholarship related to the color line, see Henry Wonham, ed., *Criticism and the Color Line: Desegregating American Literary Studies* (New Brunswick, N.J.: Rutgers University Press, 1996).
5. Douglas Baynton, *Forbidden Signs: American Culture and the Campaign against Sign Language* (Chicago: University of Chicago Press, 1996).
6. As Margalit Fox reports, "[I]n these . . . villages, the deaf are integrated into every aspect of local life, living, working, marrying and conversing side-by-side with their hearing brethren." See Margalit Fox, *Talking Hands: What Sign Language Reveals about the Mind* (New York: Simon & Schuster, 2007), 146.
7. Laurent Clerc, transcription of account in the *Philadelphia Gazette and Daily Advertiser,* December 11, 1816, Laurent Clerc Papers no. 69, Manuscripts and Archives, Yale University Library; reprinted in *A Mighty Change: An Anthology of Deaf American Writing, 1816–1864*, ed. Christopher Krentz (Washington, D.C.: Gallaudet University Press, 2000), 12.
8. Carol Padden and Tom Humphries, *Inside Deaf Culture* (Cambridge, Mass.: Harvard University Press, 2005), 58.
9. *An Address Written by Mr. Clerc: And Read by His Request at a Public Examination of the Pupils in the Connecticut Asylum, before the Governor and Both Houses of the Legislature, 28th May, 1818* (Hartford, Conn.: Hudson, 1818); reprinted in Krentz, *A Mighty Change,* 16–17.
10. John Burnet, *Tales of the Deaf and Dumb, with Miscellaneous Poems* (Newark, N.J.: Olds, 1835); reprinted in Krentz, *A Mighty Change,* 38.
11. Ibid., 50.
12. Ibid., 86.
13. Adele M. Jewel, *A Brief Narrative of the Life of Mrs. Adele M. Jewel (Being Deaf and Dumb)* (Jackson, Mich.: Daily Citizen Steam Printing House, 1862); reprinted in Krentz, *A Mighty Change,* 125.
14. Du Bois, *The Souls of Black Folk,* 3.
15. John Carlin, "The Mute's Lament," *American Annals of the Deaf and Dumb* 1 (1847); reprinted in Krentz, *A Mighty Change,* 92.
16. John J. Flournoy, "Scheme for a Commonwealth for the Deaf and Dumb," *American Annals of the Deaf and Dumb* 8 (1856); reprinted in Krentz, *A Mighty Change,* 167, 166.
17. Morrison describes the "Africanist presence" as "the denotative and connotative blackness that African peoples have come to signify, as well as the entire range of views, assumptions, readings, and misreadings that accompany Eurocentric learning about these people." See Toni Morrison, *Playing in the Dark: Whiteness and the Literary Imagination* (Cambridge, Mass.: Harvard University Press, 1992), 6–7.
18. Herman Melville, *Moby-Dick; or, The Whale* (1851; repr., New York: Penguin, 1992), 135. Subsequent references to this work appear in the text.
19. Lydia Huntley Sigourney, "Prayers of the Deaf and Dumb," in *Scenes in My Native Land* (Boston: Munroe, 1845), 240.
20. Ambrose Bierce, "Chickamauga," in *The Collected Works of Ambrose Bierce* (1889; repr., New York: Neale, 1909), 2:51.
21. Ibid., 2:57.
22. William Craft, *Running a Thousand Miles for Freedom* (1860; repr., Athens: University of Georgia Press, 1999), 29.
23. Mark Twain, *The Adventures of Huckleberry Finn* (1885; repr., Boston: Bedford, 1995), 163.
24. Ibid., 156.
25. See, for example, Jill Jepson, ed., *No Walls of Stone: An Anthology of Literature by Deaf and Hard of Hearing Writers* (Washington, D.C.: Gallaudet University Press, 1992); Lois Bragg, ed., *Deaf World: A Historical Reader and Primary Sourcebook* (New York: New York University Press, 2001); Tonya Stremlau, ed., *The Deaf Way II Anthology: A Literary Collection by Deaf and Hard of Hearing Writers* (Washington, D.C.: Gallaudet University Press, 2002);

and John Lee Clark, ed., *Deaf American Poetry: An Anthology* (Washington, D.C.: Gallaudet University Press, 2009). For a recent collection of fiction by deaf and hearing authors, see Edna Edith Sayers, ed., *Outcasts and Angels: The New Anthology of Deaf Characters in Literature* (Washington, D.C.: Gallaudet University Press, 2012).

26. For a useful introduction to American Sign Language literature, see H-Dirksen L. Bauman, Jennifer L. Nelson, and Heidi M. Rose, ed., *Signing the Body Poetic: Essays on American Sign Language Literature* (Berkeley: University of California Press, 2006).

25

DEAF MUSIC

Embodying Language and Rhythm

SUMMER LOEFFLER

Music is the universal language of mankind.
—*Henry Wadsworth Longfellow*

There is no music in this world for the deaf
people except that of their own creation.
—*Alexander Pach, "With the Silent Workers"*

It has been observed that there is "no culture known to man, no single civilization of the past, that does not have its own body of music."[1] Definitions of music are constructed around the central property of possessing sound, raising the question of whether Deaf culture is the only culture that does not use aural music for expressing cultural ideas.[2] The notion of a culturally Deaf music raises a provocative question: must music *require* hearing? If so, what is the role of Deaf people in the world of music? Or better yet, what will the musical world gain from Deaf music? To find answers, one must explore and challenge the traditional boundaries of music, examining the process of appropriating and reinscribing an auditory art form to fit the sensory experiences (visual, tactile, and/or auditory) of Deaf people. In this exploration, we shall discover how understanding Deaf music, through its unique elements comprising visual language and tactile rhythm within the worlds of sound and silence, contributes to the wider understanding of the nature of music itself.

The journey to a better understanding of what makes music the "universal" language for most cultures begins first with an exploration of its origin. As I mentioned earlier, music plays a profound role in human culture and evolution. Archaeologists Graeme Lawson and colleagues have been discovering a variety of musical instruments, the most ancient being the "Neanderthal flute," created from bone pipes, showing the significance of music since the dawn of humankind.[3] According to Daniel Levitin, a neuroscientist and musicologist, music can help us understand how humans have evolved: "Anyone who wants to understand human nature, the interaction between brain and culture, between evolution and society, has to take a close look at the role that music has held in the lives of hu-

mans, at the way that music and people co-evolved."[4] We have musicologists and anthropologists to thank for their archaeological evidence and discoveries that show us how music has evolved.[5] "[E]ven rare, indigenous, and preindustrial music is now available to us. Cultures that have been cut off from industrialization and Western influence have had their music preserved. . . . [I]t may have been unchanged for many centuries, giving us a window into the music of our ancestors."[6]

Music has also served as a catalyst for change for many nations and communities. During hard times and battles, music has helped oppressed or victimized groups gain victory by the power of its universality and influence.[7] Slave songs and protest songs during apartheid in South Africa are two such examples. In these cases, music was important not only in communicating a political message beyond words but also in serving as a tool of resistance; songs bonded communities, buoyed defiance in the face of bullets, and sowed concern in the ruling elite. The music and the revolution were inseparable; wars cannot be terminated without the singing of the people.[8] National identity and music are also tightly intertwined when it comes to celebrating and honoring one's country. America's songs of nationalism promote American pride; "The Star-Spangled Banner" and "God Bless America" are examples of nationalistic songs sung in schools and at football games. George Revill writes, "Music as an art for the nation came to represent, for land and people, the most natural expression of their deepest essence and spirituality."[9]

Today, the role of music cannot be overemphasized; its use is so prevalent that it has permeated every human ritual, not to mention entertainment. Mothers from every culture sing to their babies as a way to soothe them.[10] Americans nowadays "spend more money on music than they do on prescription drugs or sex. . . . [T]he average American hears more than five hours of music per day."[11]

In *The World in Six Songs,* Levitin mentions his reluctance to appear ethnocentric when making claims about the powerful influence of music in different cultures: "I didn't want to be culturally biased, or fall prey to any of a number of other insidious biases of gender, genre, or generation, or even pitch bias or rhythm bias. So I asked a number of musicians and scientist friends what they thought all music has in common."[12] Levitin's anthropologist friend answered that he was asking the "wrong question." Using the words of anthropologist Clifford Geertz, he suggested that a better question to ask about music's universality is not what all musics have in common but how they *differ.* He goes further to say that to better understand "what makes us most human is to thrust ourselves face-to-face with the enormous diversity of things that humans do. It is in the particulars, the nuances, the overwhelming *variety* of ways we express ourselves that one can come to understand best what it means to be a musical human."[13]

Music may be universal, but the ways music sounds in different cultures are different, as are its uses and purposes. The Kaluli people of Papua New Guinea, for instance, embody the environment through their songs. They sing with birds,

with insects, with tree frogs and tumbling waterfalls, and with the rain itself: "And when the Kaluli sing with them, they sing *like* them. Nature is music to the Kaluli ears. . . . Kaluli music is naturally part of the surrounding soundscape. . . . In this rainforest musical ecology, the world really is a tuning fork."[14] The songful language of the Kaluli also is rich with onomatopoeic words that echo the speech of animals as well as mimic the diverse swirling, bubbling, and plopping sounds made by water in the rainforest. Similarly, the music of the Kreung tribe in the remote highlands of Cambodia is radically different from Western musical culture, with its gongs and instruments that sound a bit like an insect buzzing.[15]

Redefining Music

Like the Kaluli and Kreung cultures, Deaf culture adds to the wide diversity of music in the way it embodies the language and culture in its musical expression. Deaf people operate in a different sensory universe and thus have formed a unique take on music, one which encompasses visual and tactile forms.[16] In the field of sensory studies, Deaf people challenge the fundamental definitions of music, which are based in sound—just as sound was thought to be similarly tied to language through speech. As Pamela Wright-Meinhardt writes in "A Letter to C. F.," "The organ of the ear is a small compartment of a whole, not the whole of a person. Millions of nerves race through a body; what's to say a few in the ear destroy a person's ability to understand music?"[17]

Differences among bodies play a factor in shaping the way people think about how sound is conveyed. Disability studies shows that people with disabilities repudiate and redefine widespread concepts of the body that are created by mainstream culture and society. Joseph Straus challenges the concept of hearing music by looking at outcomes from music-cognition research. The selected subjects, he discovers, are usually undergraduate students at a research university in the United States; they are "homogenous not only in age and class, but also in embodiment and ability." He argues against this methodology, saying that participants who are selected because of their "normal embodiment" are taken as "representative of human beings in general."[18] He goes further to explain what's wrong with the picture: "We exclude people whose physical or intellectual differences impinge on their cognition of music, including, for example, listeners who are autistic, hearing impaired, or visually impaired." Straus analyzes normal hearing and says it is a "cultural and social construction and a historical artifact."[19] Nicolas Mirzoeff adds to Straus's discussion about cultural construction, mentioning that deafness is "always a cultural construction in need of renewal, and an image in need of focus and definition." He encourages Deaf people to reframe deafness and points at the origin of the frame: "In order to visualize deafness, a screen must be created and defined, which in turn requires that it be framed. . . . Neither the hearing nor the deaf live in self-contained worlds, but are interdependent on each other. For as the hearing look at the deaf, the deaf look back and disrupt or

confirm the image produced. . . . It takes two people for deafness to be seen, one with hearing and one without."[20] Speculating on the concept of sound and music's universality, Benjamin Bahan suggests that the fundamental element that makes us all musical humans is our perception and composition of rhythm, an interplay of sound and silence.[21] Within the context of human cultures and the diversity of musical forms, we may now begin our journey to understand what makes Deaf people musical humans. In order to do that, the relationship that Deaf people have with the two words *sound* and *silence* must first be explored.

Sound and Silence: Hearing Constructions of Deafness

There is a misconception among hearing people that Deaf people live in a soundless world that is portrayed by the metaphor of "silence." This metaphor is used predominantly in literature and films about Deaf people. For hearing people, the metaphor of silence, Carol Padden and Thomas Humphries write, depicts "what they believe to be the dark side of Deaf people, not only an inability to use sound for human communication, but a failure to know the world directly."[22] This message conveys the idea that sound is an essential object for survival. Douglas Baynton observes that when hearing people think of "the world of the deaf as silent, they are comparing and reducing an identity, a way of life, an indefinitely complex set of social and cultural relationships to a simple and concrete phenomenon: a temporary absence of sound."[23] Baynton believes that "silence" is not a straightforward and unproblematic description of the experience of deafness; rather, "silence is experienced by the hearing as an absence of sound. For those who have never heard, deafness is not an absence."[24] Lennard Davis explores meanings of silence in *Enforcing Normalcy* and (citing Adam Jaworski) reveals that "western culture is organized to discourage silence."[25] A brief scan of the *Oxford English Dictionary* reveals the metaphorical use of *silence* to stand for "death, night, or incomprehensible nature." Eternal silence, for hearing people, equals death, absence, and meaninglessness, and because of that, it is avoided at all costs.

Padden and Humphries point out that, for hearing people, "sound is a comfortable and familiar means of orienting oneself to the world. And its loss disrupts the way the world can be known."[26] In addition, the inability to talk is viewed as negatively as the inability to hear, H-Dirksen Bauman explains the notion: "Historically, we humans have identified ourselves as the speaking animal; if one cannot speak, then he or she is akin to human in body but to animal in mind. In this orientation, we see ourselves as becoming human *through* speech."[27]

The *Oxford English Dictionary*'s definition of sound reads as follows: "The sensation produced in the organs of hearing when the surrounding air is set in vibration in such a way as to affect these; also, that which is or may be heard; the external object of audition, or the property of bodies by which this is produced. Hence also, pressure waves that differ from audible sound only in being of a lower or a higher frequency." Notice these words: *organs, hearing, heard, audition, audible sound*. All

of them connect to the organ of the ear, and Deaf people do not have adequate access to sound through that organ. Bauman argues that the "traditional parsing of senses in the West is a bit of a folk belief that links each sense with a particular organ, instead of seeing perception as a more malleable, synesthetic process."[28] It is clear that, for hearing people, sound has an important and active role to play in the organization of social, economic, and political spaces. As we have seen, Deaf people's conceptions and experiences of sound differ from those of the rest of the world, and their cultural value of sound, or lack thereof, distinguishes them from the majority. Hearing people may not notice this difference, depending on how much they know about the culture of Deaf people. Hilde Haualand, in search of the metaphysics of sound, summarizes the paternalistic form that hearing people impose on Deaf people: "Hearing people's quest for 'integrating' or 'including' Deaf people might be based in their auditive sense of belonging because this is their embodied way of making relations. Their attempts to 'include' Deaf people and make Deaf people hear same too often results [*sic*] in oppression of the Deaf-embodied ways of perceiving, mapping, and learning about the world."[29]

Hearing people have been interested in music education for deaf students for a long time.[30] Historical documentation of the use of music with deaf children can be dated as far back as the early seventeenth century in Europe, as a method to measure children's hearing capacity, which marks the "birth of deafness."[31] Writings about music and the deaf by hearing people can be found in historical journals and accounts dating as far back as 1848.[32] Alice-Ann Darrow, who has written on the topic of music and Deaf people in numerous music journals, notes that there are no entries on this topic written by Deaf people themselves, unless they were responding to the music-education methods that were set up by hearing educators. This observation "calls in question the importance of music in the lives of deaf individuals, and underscores the notion that the hearing are speaking for the deaf, perhaps erroneously, regarding this importance and value of music in educational programs for the deaf."[33] Darrow discloses that the popular assumption that deafness forecloses one's access to music is a form of ethnocentrism. Joseph Straus argues that "music therapy is a normalizing enterprise, bound up with the medicalization and attempted remediation of disability." Straus continues: "There is a very long history stretching back to classical antiquity of accounts of the power of music to cure or disable—but that's nothing new."[34] This history that people with disabilities have with music as a therapeutic approach parallels the history that Deaf people have with music; it is a perspective that constructs Deaf people as broken social bodies in need of repair.

Many Deaf people in history have shown that music has a different meaning for them and thus have reframed the way Deaf people perceive and enjoy music. Take Abbé de l'Épée, for example, who brought us an idea that may help us understand how Deaf people understand music. He wrote in 1776 that Deaf and hearing people alike should change their presumptions of Deaf people: "This [book] will

show, as clearly as possible, how to go about bringing in through the window what cannot come in through the door; namely, to insinuate into the minds of the deaf through the visual [and tactile] channel what cannot reach them through the auditory channel."[35] As Épée suggests, what cannot be brought through doors (hearing) can be brought through the windows (sight and touch). Allan and Alice Terry, two prominent leaders in the deaf community in the early twentieth century, speculated upon what music is enjoyable and accessible by Deaf people in their *Silent Worker* articles. Instead of focusing on the "door," they implied that we must peer out the window and see what kind of music comes from Deaf people without any influence from the faculty of hearing. Allan suggested that attention be called to "music's own twin, poetry as we deaf may only find [music] in poetry."[36] It was not clear what kind of poetry he was talking about, but Alice Terry pointed out a similar vehicle: singing in signs. She discovered at community events and Deaf clubs that Deaf people liked to sing in signs. "Look at a deaf-mute," she wrote, "singing in signs. His body is aglow with rhythm. When [an oral deaf person] sings . . . rhythm is noticeably absent. It is in gestures alone that the mute can express his rhythmical soul."[37] Although sound is accessible to Deaf people through vibrations of rhythm, sign language can also serve as a medium for bringing visual rhythm through the "window," the eyes. What all of these Deaf figures brought up are possible venues we should explore to identify the elements that make up the indigenous, untouchable musical culture of Deaf people. How can Deaf people claim the frame that has been imposed on them, especially regarding their relationship with music? I propose that we look into places where Deaf people go beyond normal hearing and find venues where they discover appreciation for music through other senses. This will help strengthen the Deaf community's argument regarding why the definition of music needs to be expanded to include all senses. We shall begin by understanding how sound travels through the human body and the sensorial realm in which Deaf and hearing people experience music.

Sensing Rhythms: The Deaf Brain on Music

"What role did the musical brain have in shaping human nature and human culture in the past fifty thousand years?" is an essential question that Levitin brings up in *The World in Six Songs*. He then condenses the question to "How did all this music make us who we are?"[38] We may inquire how the Deaf brain functions while perceiving music to understand how it has shaped us as musical humans.

Cognitive scientists, neurologists, linguists, and other researchers have engaged in studies that suggest that hearing is not a prerequisite to appreciating music; rather, physiology and sensory channels contribute to Deaf people's enjoyment of music. To better understand how sound is perceived through the human body, it may be necessary to analyze how sound is produced and how the human body receives sound. The sense of hearing is a mechanical sense akin to a sense of touch. This perception is executed by tiny hair fibers in the inner ear that detect

the motion of a membrane that vibrates in response to pressure. Sound travels in two ways: it is composed of vibrations propagating through a medium such as air, and it travels through the auditory channel and through the skin. In other words, sound can be detected as vibration conducted through the body by haptic means. This idea gives us an opportunity to explore venues where Deaf people do have access to sound, and we may find our answers in the fields of neuroscience and cognitive science.

Neuroscience research has helped scientists discover what happens to the human brain when a certain sensory modality is not functioning during the development stage. It has been noted that the neural structure of the brain has "the potential to mediate functions for the remaining modalities."[39] Accordingly, when one sensory modality is lacking or absent, the brain will reorganize neural pathways to adapt and function.

Given that vibrations are caused by sound, and sound is a property of music, Deaf people can perceive music through the auditory channel. Dean Shibata, a researcher at the University of Washington, found evidence that the auditory cortex of the brain could be stimulated by another sensory channel, the sense of touch. Functional magnetic resonance images (fMRIs) of the brains of Deaf people indicate that *feeling* music sends pleasant stimulation to the same area of the brain that is normally used for hearing sounds.[40] In other words, Deaf people get pleasure from music through sensing vibrations; they *feel* music in a manner similar to the way others *hear* it.[41] The research shows us that sound travels through the Deaf body and that hearing is not a prerequisite for appreciating music.

As Andrew Fisher explains, "[Deaf people] have for so long associated sound with ear, that these are not distinguishable apart, but we often forget the ear is [not the] only transmitter into which sound enters."[42] Fisher is correct, for sound can travel in numerous ways: the ear is one way, and another is the skin.[43] He expresses the sentiment that Deaf people all are born adequately with a sense of rhythm. Many Deaf people know that the absence of hearing has nothing to do with the absence of sound and that rhythm is prevalent in our comprehension of sound. Fisher thinks that the concept of sound should not be dictated only as "aural (by ear) but as sensual (by all senses)."[44] This speculation reminds us that we have yet another venue to explore rhythms that serve as "music" to Deaf people.

Introducing Music through a Visual Language

Before we can look at how music enters Deaf people's brains, we must first understand how language plays a role in cognition. Noam Chomsky has clarified the myths of how the brain processes language and writes on the way Deaf people acquire language: "Thoroughly highly specialized, the language faculty is not tied to specific sensory modalities, contrary to what was assumed long ago. Thus, the sign language of the deaf is structurally much like spoken language, and the course of acquisition is very similar."[45] This insight may be interesting to apply

to Deaf children's acquisition of language, especially using music as a medium. Laura-Ann Petitto, a researcher in the field of neural and behavioral aspects of early sign-language development, explains that the hand babbling of a deaf child is rhythmically distinct from all hand movements that hearing babies make.[46] Similarly, hearing babies produce a songlike babbling that has rhythm when surrounded by music while they are fetuses in the womb.[47] Deaf babies, Petitto discovered, respond similarly both inside the womb and outside, when they babble with their hands. Petitto also describes how prosodic elements of ASL were included when mothers signed to their babies, providing a language model. This may lead to a possible link between rhythm in music and prosody in ASL that helps deaf children learn.[48] Just as music is expressed through the spoken language of hearing mothers singing to their babies, Deaf babies also find delight in music when rhythm is visible through sign language.

Both Petitto's and Chomsky's findings correspond to the neuroscience claims that the human brain is flexible, a term known as neuroplasticity. When a part of the brain responsible for processing sensory experience is lacking, the brain adjusts to "work" for the nonreceptive sense. So, when the auditory cortex does not interpret sounds, the brain modifies and uses the "space" to function as an additional system. This may suggest that Deaf individuals experience a sensory overlap wherein the visual and tactile components "take over" the function of the auditory cortex through the expansion of the visual cortex.

Karen Emmorey affirms that auditory areas enhance visual processing. This researcher from the Salk Institute reveals the brains of both Deaf and hearing people through MRI images. Native Deaf signers are significantly faster than hearing nonsigners in detecting motion. The process in the Deaf brain known as auditory deprivation indicates that there is increased activation in the visual-attention part of Deaf people's brains. Emmorey's research suggests that "auditory deprivation leads to enhanced attention to motion in the visual periphery."[49]

This research provided by linguists Chomsky and Petitto and neuroscientists Emmorey and Peter Hauser makes up a neurological explanation of how Deaf people can find pleasure in music: prosodic hand movements or visual rhythm is pleasing for Deaf children because they can see the rhythm of the music.[50] This research, however, doesn't explain how Deaf people may *compose* or *create* music.

Musical Imagery, Inner Hearing, and Temporality

Cognitive linguistics has discovered other functions in the same area of the brain that is activated when sign language is used. Levitin shares his discovery in *This Is Your Brain on Music:* "Most astonishing was that the left-hemisphere regions that we found were active in tracking musical structure were the very same ones that are active when deaf people are communicating by sign language. . . . We were now looking at a region that responded to sight—to the visual organization of words conveyed through American Sign Language."[51] This may be the reason why

many Deaf and hearing people say sign language is music to their eyes. Indeed, sign language could provide a new way of looking at how music can be perceived. How do we make sense of Levitin's new discovery?

Let's begin by looking at the basic element that music and sign language share: temporality.[52] Sign language is a visual and spatial language, and it occurs over time. Although it is a visual language, it is not frozen like written text, a painting, or an object of art. Levitin differentiates music and art, saying, "The most important way that music differs from visual art is that it is manifested over time. As tones unfold sequentially, they lead us—our brains and our minds—to make predictions about what will come next."[53] So, in that sense, sign language and music could be performed at the same time, but one individual cannot express both at the same time because of the limited structure of the spoken language and the expressive modality. Expressing music with sign language or vice versa cannot happen simultaneously for the same reason that simultaneous communication (using sign language and spoken English at the same time) is not effective. Although the latter form of expression is pretty complicated, it does not stop Deaf people from creating music through sign language. It may have to do with the Deaf brain's ability to perceive and "sing in signs."

Through this cognitive linguistics and neuroscience research, we have discovered that brain plasticity and Deaf perception of music are not limited in ways we previously thought. Thus, the notion of plasticity may be applied to the way Deaf people have created music with or through sign language. Our next exploration is on the vehicle that Deaf people have substituted for sound, and that vehicle is rhythm.

Transgressing Sound to Rhythm

Rhythm is a vital component of music that has helped humankind in a variety of ways. First, it serves as a mnemonic force for encoding knowledge. Levitin shows how oral traditions have succeeded in preserving information: "The multiple reinforcing cues of a good song—rhythm, melody, contour—cause music to stick in our heads. That is the reason that many ancient myths, epics, and even the Old Testament were set to music in preparation for being passed down by oral tradition across the generations."[54] Second, rhythm helps train motor coordination in children's activities, such as jumping rope.[55] This is precisely why, according to Rita Corey, a longtime choreographer who has taught dance to Deaf people for more than twenty years, Deaf people do not have a problem picking up new dance steps following the common dance count (counting up to the number eight) along with the music.[56]

Rhythm in music has provided "input to the human perceptual system that allows for the prediction and synchronization of different individuals' behaviors."[57] This statement supports the imitation behavior of the earlier Petitto study in which a Deaf child acquired rhythm through imitating the prosodic element of

the ASL stories given by a teacher. It could also explain why Deaf people, when they see or feel a rhythmic clap, can learn to synchronize with the clap and join in harmonic clapping. Contemporary evidence of this tendency is reaction to the "Bison Song," the spirit song of Gallaudet University. The synchronized clapping during the performance of the song conceals the hearing abilities of its leaders.

Last, but not the least, rhythm has been known as a tool people use to maintain their culture. In Alain Locke's *The Negro and His Music,* the author mentions that rhythm is the connecting link to different forms of music descended from Africa: "[It] is of course, the element of rhythm, which [is] everywhere distinctive enough to be recognized. . . . This racial mastery of rhythm is the one characteristic that seems never to have been lost."[58] This notion could explain why African American music has evolved into many forms (such as jazz, hip-hop, R&B, and blues), contributing to the diversity of musical humans. This brings to mind another question: what great music have Deaf people created from rhythm?

Deaf Musicians and the Haptic Realm

Jamie James suggests it was rhythm that made Beethoven's music great: "Yes, it is great music—but why? Not because it has lovely melodies. . . . It is great music because it pointed the way to a new direction."[59] After he became deaf, Beethoven had cut the legs off his piano to get a deeper connection to rhythm through the tactile sense, and this could be how the Ninth Symphony was created.[60] Oliver Sacks explores "innate musicality" and believes that "even profoundly deaf people may have innate musicality. . . . [They] are very responsive to rhythm, which they feel as vibration, not as sound."[61]

The musical documentary *Touch of Sound,* about Evelyn Glennie, a percussionist who is deaf, highlights her unique perspective and interpretation of music. She often talks about the sense of touch. Glennie, in this documentary, visits a deaf school and plays her percussion instrument behind a deaf student. She suggests that the student take off her hearing aids, as she will feel more in her body. Profoundly deaf, Glennie has trained herself to detect all different kinds of sounds through her skin and believes that we can train ourselves to detect different frequencies of vibration. For people who can hear, when sound (auditory) frequency gets "higher and our ears become more efficient they drown out the more subtle sense of 'feeling' the vibrations." Glennie describes how she spent a lot of time refining her ability, until eventually she managed to detect both high and low sounds: "The low sounds I feel mainly in my legs and feet and high sounds might be in particular places on my face, neck, and chest."[62] When she talks about using the body to create rhythm, she says that breathing is the fundamental essence of who we are, and rhythm and breathing are connected. Glennie brings us an inward way to experience music, through our skin and through breathing. But what about the projection of music as an outward vehicle for cultural expression, such as moving our bodies and dancing?

Moving to Rhythm

Cynthia Peters has analyzed Deaf people's intensive use of body movements in rhythmic song signing and other cultural expressions. She discovers from anthropological records that rhythm "arose long ago out of the movement and manipulation of the body."[63] She reveals of humans in the past that "an integral part of sound and music" was the human body, and the body was valued as a means of producing and experiencing music: "In centuries past, making music often involved human hands and feet; people would bang drums with their hands, vigorously shake gourds, and lift their feet up and down while chanting and calling out in song." She speculates about the system of values that has changed for today's musical humans: "Only relatively recently has music become increasingly divorced from the body in everyday discourse. Aside from the more exuberant musicals and performers, many songs performed today entail a stationary person making love to a microphone, and a great deal of modern music is instrumental, not vocal."[64] Deaf people, however, do not fall in that category. Everyday discourse among signing members of the Deaf community involves the use of the body. Signing bodies are constantly flowing, expressing ideas, and their faces reflect the emotions as they communicate their thoughts. Fara Wilson, a Deaf woman who studied the way music serves as a bridge to literacy for Deaf children, theorizes that deaf people, especially those who use ASL, have strong kinesthetic intelligence: "Exposing deaf children to music with its vibrations both taps into their kinesthetic intelligence and strengthens their music intelligence. Thus the child would develop his/her learning strengths."[65] This is true as well for Deaf people who perform music. Space use on the Deaf performing stage is not restricted to the microphone but is often adapted to "embody" the performer's style of performance, making sure the audience can see him or her perform. Joseph Straus comments that "feeling it [music] may extend beyond the tactile to the kinesthetic. One can hear music, make sense of music, cognize music, by moving or dancing to it." He explains further that through intensive use of the body while listening to music, especially dancing and rocking back and forth in rhythm, a person may experience "and understand music differently from the immobile, passive listener of the psychological studies" mentioned earlier in this chapter. He adds: "A listener who is also a dancer is likely to be more attuned to musical rhythm than the normal listener."[66] Straus then brings up a clever idea that ties together all of his thoughts about how Deaf people "listen" to music and about a unique form of music that Deaf people could create: "Let us then imagine a deaf listener as one who engages the visual, the tactile, and the kinesthetic in appreciating music: deaf hearing involves seeing, feeling, and moving to music. All of these modes are foreclosed to the [hearing] listener."[67] Rhythm allows Deaf musicians and listeners to connect with music because Deaf people have a sensory difference from the majority; they experience a different "way of being." It is a question how they have taken advantage of other sensory

channels in their everyday lives. As we have discovered, rhythm has two vehicles: visuals and vibrations. But are Deaf people fully aware of this? Do Deaf people ride both vehicles on their journey as musical humans? The only way to find the answer is to seek deep into the heart of Deaf culture. We may begin our journey with the American Deaf culture.

Indigenous Music of American Deaf Culture

The American Deaf culture and language have an indigenous rhythm, music, and song.[68] Language and literature are the most important vehicles for "driving music" in the Deaf community, using the tools of rhythm, rhyme, and tempo that are presented in vernacular performances. The American Deaf community has expressed many of its songs through the rich culture of rhythmic literature, and the genre we will focus on in this chapter is percussion signing.

Benjamin Bahan explains in his article "Face-to-Face Tradition in the American Deaf Community" that there are different kinds of ASL songs that incorporate percussion signing, with sound or without. (Percussion signing incorporates a visual and tactile beat with the performance of "songs" in sign language. It does not necessarily require a drum, but it does require a beat of some kind.) He specifically mentions spirit songs, which stand under their own category and are popular and widely accepted in American Deaf culture.[69] Not only are they popular, they are also a tradition, for these songs follow beats that all Deaf people can follow and "sign along" with. Many of these songs follow a "one, two, one-two-three" rhythm. These beats may be driven by the properties that make up sign language, an interplay of single or repetitive movements depending on the signs used and the rhythm followed. "The rhythm in percussion signing," Bahan explains, "is derived from the language itself, and the simple cadence allows more Deaf people to join in the synchronized signing of the song, and *that* is what should be considered fundamental for indigenousness."[70] Language is the property that contributed to indigenousness, but the duration of this song form strengthens the argument further.

Padden and Humphries reveal that the origin of this song pattern seems to have been initiated by George Kannapell, a pep-squad leader at Gallaudet College in the early 1930s. After he graduated, he continued the spreading of spirit songs with "one, two, one-two-three" routines. The songs all "tell a story in some way. . . . And they are all group songs, used to incite a crowd to good cheer and a sense of unity."[71] The spirit song's popularity is revealed in many old films in which every scene that features a deaf performer doing a song also features a crowd, mostly clapping in unison. A well-known percussion signing song was featured in a documentary about the lives and culture of Deaf Americans in the 1930s and was performed by George Kannapell. Cynthia Peters describes Kannapell's signing: the visual fluency and dexterity that include rhythm and rhyme in his performances "play against the aural musicality of the mainstream society."[72]

Figure 25.1. Percussion song performed during the "Unity for Gallaudet" protest in May 2006 to ignite the crowd.

Several Deaf-literature scholars comment that percussion signing seems to have disappeared, with the exception of the "Bison Song."[73] This fight song incorporates the "one, two, one-two-three" beat, ASL, and the drive to win athletic competitions to prove that Deaf athletes can prevail against their hearing rivals. Benjamin Bahan does not believe that percussion signing is becoming extinct: "Percussion signing may not be as widespread as it used to be in the earlier part of the twentieth century, but it is far from gone, and it may be reviving in situations that involve the need for sense of unity among a group."[74] He mentions several places where he has seen percussion signing and specifies that at protests, percussion signing has formed bonds between members of the Deaf community. During protests at Gallaudet University in 1988 and 2006, a variety of percussion songs were used, providing a sense of unity that may have contributed to the success of the protests.[75]

In the majority of the Deaf community, individuals do not produce music alone; instead, they create music together, thus extending the communal sense of experiencing music. One person cannot play a drum and be responsible for signing the music at the same time. This teaming to create, and to "listen to" music, together is evident in the "Bison Song," as the song would not exist without a team, and team members always had a crowd to inspire them.

An Analysis of the "Bison Song"

There are numerous reasons why fight songs, like the "Bison Song," are the indigenous music of Deaf culture. The "Bison Song" has a tactile rhythm that the drummer provides, assisting the visual-sign rhythm. The interplay between the drum and the silence is what creates music. The intelligent blend of visual and tactile aspects is an embodiment of this "Deaf music."[76] The tactile dimension added through drumming and the repetition of signs (their orientation, hand shapes, and movements) visually convey rhyme. The sign language shows the cultural language of the Deaf. The drum shows cultural presence and the drummer "produces not only the beat, but a pounding that extends inward just as much as it fills space with rhythm, contouring embodied sensing with the pulse of culture."[77]

To this day, there is high demand to perform the "Bison Song" at Gallaudet college activities. Students at the National Institute for the Deaf (NTID) at the Rochester Institute of Technology created the "Tiger Song" using the same percussion signing and a snare drum. During the annual Rockfest/Brickfest, where Gallaudet and NTID compete in activities and games, the "Bison Song" and "Tiger Song" teams compete onstage. The "Bison Song" shows clearly that "deaf people appreciate music, rhythm, and song and that rhythm, music, and song can be conveyed visually by the tempo of the performer's signing and the movement of his or her body, as well as aurally."[78]

Figure 25.2. Student protesters begin signing "Unite Gallaudet Now" in unison at the "Unity for Gallaudet" march to the Capitol. *Left to right:* Latoya Plummer, Chris Corrigan, and Tara Holcomb.

This indigenous form of Deaf music, the spirit song, has lasted for almost a century. Its popularity is evident in many films, and many members of the Deaf community know its rhythm by heart. Deaf people created it, have carried it on as tradition, and still perform it today. Alexander Pach, editor of the *Silent Worker*, sums up the creation of an indigenous Deaf-music practice: "[T]here is no music in this world for the deaf people except that of their own creation."[79] The "Bison Song" is not the only way to view Deaf music, but the history of this song suggests that Deaf people are indeed musical humans with their autochthonous song traditions, and they have redefined the meaning of music to include Deaf-embodied music.

Embodying Music the Deaf Way

Hilde Haualand explores the concept of sound among hearing people and discovers what creates a community.[80] She explains that in the Norweigan language, the word that translates as "to hear" means to belong or connect; therefore, "people who belong to each other *hear the same* or hear together and form communities where they hear the same language, voices, noises, and music."[81] For hearing people, the act of hearing is tantamount to the act of belonging. But what, then, of Deaf people? Does this mean that Deaf people don't entirely belong to each other because they don't all hear the same thing and share the same music components? Douglas Baynton answers that Deaf people connect to each other in a different way: "Deaf people align themselves along sensory differences; they form unusually strong transnational bonds and exhibit wholly unique enculturation patterns."[82]

Deaf culture may be one of the leading examples, if not the only one, of communities that truly embrace and understand the concept of belonging, as many of its members are often unwelcome to participate in the creation of aural-based music. Additionally, with their inadequate access to the music of the hearing world, Deaf people often come together to create their own, whether through percussion signing, ASL poetry, or contemporary music videos; this may indicate that we "hear the same" more than any other cultures. ASL poetry slams, for example, are an example of the way Deaf music naturally flourishes in new places when Deaf people don't feel they belong elsewhere but still want to express themselves. This also applies to Deaf cultures on an international level. We have seen examples of musical performances by various Deaf people at the international conferences "Deaf Way I" and "Deaf Way II" (China's My Dream dancers, for example), as well as at other conferences and Deaf sporting events. Some Deaf musical artists have become popular with both Deaf and hearing audiences, such as the popular Deaf veejay Jascha Blume, of Amsterdam, or internationally acclaimed Deaf Finnish rap artist SignMark.[83] With the rise of rap culture, more Deaf deejays and rappers have emerged in cities that have a large population of Deaf people. Last, but not least, we have several musical performers that are all-time favorites of the Deaf community, including the Rathskellar group (which uses a mix of all varie-

ties of Deaf music) and Rosa Lee, whose musical works are mostly exhibited via YouTube.[84]

Although it is not emphasized much in Deaf literature, Deaf people *do* take advantage of architectural surroundings to enhance tactile communication and to embody materials to fit Deaf bodies and needs. One example of this is wooden floors in Deaf spaces that are used to amplify one's footsteps in order to get the attention of a Deaf person.[85] Deaf people, likewise, have applied architectural materials and objects to enhance their appreciation for music. Examples include using balloons during high school social dances and sitting on top of speakers at concerts.[86] There may be more opportunities to create more musical innovations and instruments in the future, after the Deaf community has understood its role in contributing to the universal music culture.

Deaf Music, Deaf Gain

Based on American cultural definitions, values, and views of music, it is hard to segregate the words *music* and *sound*. Contemporary research in the fields of neuroscience and linguistics strongly suggests that this phonocentric form of thinking is rather questionable. The Deaf lens challenges this notion and clarifies that sound travels in two ways: one way is appreciated by the aural sense and the other by the tactile. But because the latter is not emphasized in the music world, Deaf people are placed in a unique position as musical humans. Because of the ethnocentric assumptions of hearing people that Deaf people need music education, many Deaf people's conception of music is based on the way their hearing peers view it. At the same time, members of the American Deaf culture *do* possess a visual and tactile way of incorporating musicality with which nothing in any other culture or language can be compared and which belies the notion that Deaf Americans have little interest in music, song, and rhythm.[87] From this exploration, we can see a paradigm shift of music from an auditory-based phenomenon to an experience involving a wider spectrum of senses. We used to think that language requires sound, but were proved wrong. The fundamental question was "Must music require hearing?" Our answer? No. Deafness does not get in the way of music appreciation and production but, rather, provides an alternative form of "listening to" music. I have shown that deaf people do not have to be dominated by hearing constructions of sound but rather that our constructions of sound can help hearing people. Joseph Straus suggests a gift that deaf people have with music: "What is most distinctive about how Deaf people hear music is the extent to which they use senses other than the auditory to make sense of what they hear: they see and feel music. Hearing does not necessarily involve a one-to-one mapping of sense perceptions onto a single sensory organ; rather, hearing can be a much more multi-sensual experience."[88] This chapter shows how deaf people can answer Levitin's broad question on the role of the musical brain "in shaping human nature and human culture in the past fifty thousand years," as well as his

briefer question "How did all this music make us who we are?" As Benjamin Bahan suggested earlier about music's universality and what makes people musical humans, this discovery of an indigenous form of music coming from Deaf community and culture is an excellent test case on what music cannot live without.

The Deaf Gain focuses on what can be learned from deaf people whose "visual, spatial, and kinesthetic structures of thought and language shed light on blindspots in traditional ways of knowing," Bauman and Joseph Murray claim.[89] Once we take into account the unique contribution that Deaf musical humans can make in the musical world, we see that our understanding of music is widened and deepened, focusing more on properties of music that may transcend the individual's sense of hearing and less on hearing and sound as the material of music. In the twenty-first century, we are faced with a progressive human evolution into a world of technology where technology separates people, whether Deaf or hearing. Many hearing people listen to music "alone," through their iPod headphones, in their car, and through their personal home speakers. This habit of "listening alone" may further isolate humans from each other, and thus the universal language will become nonexistent.

The indigenous music of Deaf culture takes a different direction. Aside from using both tactile and visual senses to experience music, it involves "listening" together, uniting people whose connections are cut off by technology and Western culture. Although Deaf people are also influenced by popular culture and individualist thinking (even cochlear implants and digital hearing aids now come with adapters for individual listening), Deaf communities worldwide still exhibit a collectivist tendency by gathering together and embodying language and rhythm in song. This is apparent in community venues like churches, football stadiums, and Deaf clubs. Residential schools for the Deaf still incorporate spirit songs in rallies, talent shows, and school pageants. A Deaf music camp has been established by a group of Deaf people to continue this tradition of playing with language and rhythm.[90] The increasing recognition of American Sign Language offers more social opportunities for both deaf and hearing students who are taking ASL classes to do music interpretation through YouTube and Facebook. This behavior models a sense of unity and collectiveness that hearing people often search for.

The Deaf Gain of the visual and tactile musical community shows the world the diverse ways we listen to music and the many ways that humans are capable of creating music through visual language and rhythm. Instead of a Deaf Variety of the Human Race (as suggested by Alexander Graham Bell in 1884) or the Visual Variety of the Human Race (as Benjamin Bahan proposed), we can offer a Deaf Variety of the *Humanus musicalis,* contributing to the enormous diversity of universal musical culture.

Notes

1. Charles Hamm, Bruno Nettl, and Ronald Byrnside, cited in Daniel Levitin, *The World in Six Songs: How the Musical Brain Created Human Nature* (New York: Penguin, 2008), 71.
2. The *Oxford English Dictionary* defines *music* as: "(1) the art of or science of combining vocal or instrumental *sounds* to produce beauty of form, harmony, melody, rhythm, expressive content, etc.; (2) the vocal or instrumental *sound* produced by practical exercise of the art of music; (3) *sounds* put together in melodic, harmonic, or rhythmical combination: *the music of the wind in the pines;* (4) *sound* produced naturally which is likened to music in being rhythmical or pleasing to the ear, as the song of birds, the sound of running water, etc." Notice that sound is mentioned in each definition; this may suggest that one must have access to sound to become a musical human.
3. Lawson et al., "Music, Mind, and Evolution," Faculty of Music, University of Cambridge, http://www.mus.cam.ac.uk/.
4. Levitin, *The World in Six Songs,* 2–3.
5. Archaeological sites have revealed that some of the oldest human-made artifacts were musical instruments; see ibid., 2.
6. Ibid., 4.
7. "Subordinate groups have used music as a weapon which is able to penetrate walls and minds." Robin Balliger, "Sounds of Resistance," quoted in George Revill, "Music and the Politics of Sound: Nationalism, Citizenship, and Auditory Space," *Environment Planning D: Society and Space* 18 (2000): 602.
8. Levitin also mentions that slave songs and plantation songs helped African Americans bear the hardship of slave life.
9. Revill, "Music and the Politics of Sound," 608.
10. Sarah Blaffer Hrdy, *Mother Nature: A History of Mothers, Infants, and Natural Selection* (New York: Pantheon, 1999), cited in Levitin, *The World in Six Songs,* 126.
11. Levitin, *The World in Six Songs,* 3. In addition, the average American watches five hours of television per day, and that alone has to account for a lot of music listening.
12. Ibid., 6.
13. Ibid., 7.
14. David Abram, *Spell of the Sensuous*: *Perception and Language in a More-Than-Human World* (New York: Random House, 1996), 290.
15. Tia Ghose, "Why Music Moves Us," LiveScience.com, TechMedia Network, December 17, 2012, http://www.livescience.com/25611-why-music-moves-us.html.
16. "[I]n terms of examining Deaf people's sensory worlds, we have not yet explored in depth or discussed another territory that has been told in countless life stories and anecdotes—on the ways Deaf people develop tactile minds." Benjamin Bahan, "Upon the Formation of a Visual Variety of the Human Race," in *Open Your Eyes: Deaf Studies Talking,* ed. H-Dirksen L. Bauman (Minneapolis: University of Minnesota Press, 2008), 96.
17. Pamela Wright-Meinhardt, "A Letter to C. F.," in *The Deaf Way II Anthology,* ed. Tonya Streamlau (Washington, D.C.: Gallaudet University Press, 2002), 139.
18. Straus, "Prodigious Hearing, Normal Hearing, and Disablist Hearing," 153.
19. Ibid.
20. Nicolas Mirzoeff, *Silent Poetry: Deafness, Sign, and Visual Culture in Modern France* (Princeton, N.J.: Princeton University Press, 1995), 10, 11.
21. Benjamin Bahan, personal communication with the author, April 1, 2009.
22. Carol Padden and Thomas Humphries, "The Meaning of Sound," in *Deaf in America: Voices from a Culture* (Cambridge, Mass.: Harvard University Press, 1988), 92.
23. Douglas Baynton, *Forbidden Signs* (Chicago: University of Chicago Press, 1996), 23–24.
24. Ibid., 23.
25. Adam Jaworski, cited in Lennard Davis, "An Excursion into the Heart of Silence," in *Enforcing Normalcy: Disability, Deafness, and the Body* (New York: Verso, 1995), 108.

26. Padden and Humphries, "The Meaning of Sound," 93.
27. H-Dirksen L. Bauman, "Audism: Exploring the Metaphysics of Oppression," *Journal of Deaf Studies and Deaf Education* 9, no. 2 (2004): 242.
28. Joseph Straus, personal communication with H-Dirksen L. Bauman, June 13, 2008; presented in Straus's "Prodigious Hearing, Normal Hearing, and Disablist Hearing."
29. Hilde Haualand, "Sound and Belonging: What Is a Community?," in Bauman, *Open Your Eyes,* 120.
30. Although hearing people may have good intentions in introducing music to Deaf people, their ethnocentric attempts have done more harm than good, as hearing constructions of sound and music have influenced Deaf people to have pejorative connotations of and relationship with music.
31. The earliest-recorded substantial and scientifically oriented instance of using music with the deaf is that of Jean-Marc Itard, an otologist working in Paris in 1802. He carefully observed the responses of deaf students to the auditory stimulation of bells, a drum, and a flute; see Max A. Goldstein, *The Acoustic Method for the Training of the Deaf and Hard of Hearing Child* (St. Louis, Mo.: Laryngoscope Press, 1939), 12. The "birth of deafness" concept comes from "Enforcing Normalcy," a graduate course that the author of this chapter took at Gallaudet University in 2008, taught by H-Dirksen Bauman.
32. Parents of deaf children purchased musical instruments as a way to prevent the "too long and too often occurring seasons of unbroken silence that attended the absence of vocal conversation." W. W. Turner, "Music Education," *American Annals of the Deaf and Dumb* (1848): 2.
33. Alice-Ann Darrow, "The Role of Music in Deaf Culture: Implications for Music Educators," *Journal of Research in Music Education* 41, no. 2 (1993): 94.
34. Straus, "Prodigious Hearing, Normal Hearing, and Disablist Hearing," 158.
35. Abbé de l'Épée, "The True Method of Educating the Deaf Confirmed by Much Experience" (1776), in *The Deaf Experience,* ed. Harlan Lane (Cambridge, Mass.: Harvard University Press, 1984), 51.
36. Allan, "Music for the Deaf," *Silent Worker* 33, no. 7 (April 1921): 222.
37. Alice Terry, "Sound: Why Not Let It Alone?," *Silent Worker* 31, no. 7 (1919): 113.
38. Levitin, *The World in Six Songs*, 7.
39. S. Levänen, V. Jousmäki, and R. Hari, "Vibration-Induced Auditory-Cortex Activation in a Congenitally Deaf Adult," *Current Biology* 8, no. 15 (1998): 869–71.
40. Cited in Walter Neary, "Brains of Deaf People Rewire to 'Hear' Music," *UW Today,* University of Washington, November 27, 2001, http://www.washington.edu/news/2001/11/27/brains-of-deaf-people-rewire-to-hear-music/.
41. Although hearing people are able to feel music through the sense of touch, one of the elements of Deaf Gain is that it accentuates what hearing people overlook about their own hearing. In other words, Deaf people are teaching hearing people how they could hear better by widening their awareness of the skin as a hearing organ. H-Dirksen Bauman, personal communication with the author, 2013.
42. Andrew Fisher, *Buff and Blue,* 20.
43. H-Dirksen L. Bauman uses the hand shape for the sign HEAR and places it on the hands, arm, or chest to signify the ways that the skin and muscle "hear" sound; cited in Straus, "Prodigious Hearing, Normal Hearing, and Disablist Hearing," 169.
44. Fisher, *Buff and Blue,* 20.
45. Noam Chomsky, *New Horizons in the Study of Language and Mind* (London: Cambridge University Press, 2000), 100–101.
46. Laura-Ann Petitto, "Theoretical and Methodical Issues in the Study of Sign Babbling" (unpublished manuscript, 1987).
47. "Deaf babies babble with their hands so this is the time when they develop a keener sense

of their kinesthetic experience"; see Fara Wilson, "Music as Bridge to Literacy for Young Deaf Children in Classrooms" (capstone thesis, Gallaudet University, 2005), 31.

48. Wilson interprets Petitto's study in ibid., 24.
49. Karen Emmorey, *Language, Cognition, and the Brain* (Mahwah, N.J.: Erlbaum, 2002), 245.
50. An example of visual music using prosodic elements of ASL is Ella Mae Lentz's poem "Eye Music."
51. Daniel Levitin, *This Is Your Brain on Music* (New York: Penguin, 2006), 130.
52. "The region that was studied showed activation whenever the action/task involved organizing information over time." Ibid.
53. Ibid., 125. This idea of visual art not being "temporal" is not absolute, as ancient Chinese scrolls show the linearity of time. One must scan one's eyes over the paintings in the scrolls in a chronological order.
54. Ibid., 267.
55. "In all cultures that have a number system, children have counting songs, rhyming ditties, to help them learn their number line by rote. American culture use both spoken and singing as a double duty to train motor coordination . . . generating variations on the heard melodic/rhythmic patterns of their culture in much the same way they generate variations of speech patterns. This sort of spontaneous experimentation suggests that the predisposition toward melody and rhythm variation is hardwired in the brain." Ibid., 145.
56. Rita Corey and several other Deaf dance instructors, personal communication with the author, 2005.
57. W. S. Condon, "Cultural Microrhythms," in *Interaction Rhythms,* ed. Martha Davis (New York: Human Sciences Press, 1982), 53–77, cited in Levitin, *The World in Six Songs,* 50.
58. "From a kernel of rhythm, African music has sprouted in strange lands, spread out a rootage of folk-dance and folk songs, and then gone through the whole cycle of complete musical expression as far as soil and cultural conditions have permitted." Alain LeRoy Locke, *The Negro and His Music* (Washington, D.C.: Associates in Negro Folk Education, 1936), 140.
59. Jamie James, *The Music of the Spheres: Music, Science, and the Natural Order of the Universe* (New York: Copernicus Press, 1995), 13.
60. Once Beethoven locked himself into the silent world of his imagination, his musical genius blossomed. Unable to hear the music of his contemporaries, he conjured a world of sound different from anything previously conceived.
61. Oliver Sacks, *Musicophilia: Tales of Music and the Brain* (New York: Random House, 2005), 95.
62. Evelyn Glennie, "Hearing Essay," http://www.evelyn.co.uk/live/hearing_essay.htm.
63. Cynthia Peters, *Deaf American Literature: From Carnival to the Canon* (Washington, D.C.: Gallaudet University Press, 2000), 65. See also William Haviland, *Cultural Anthropology,* 4th ed. (New York: Holt, Rinehart, & Winston, 1983); Alexander Alland, *To Be Human: An Introduction to Cultural Anthropology* (New York: Wiley, 1981); Walter J. Ong, *Orality and Literacy: The Technologizing of the Word* (London: Routledge, 1997); and Ruth H. Finnegan, *Literacy and Orality: Studies in the Technology of Communication* (Oxford: Blackwell, 1988), 153.
64. Peters, *Deaf American Literature,* 65.
65. Wilson, "Music as Bridge to Literacy for Young Deaf Children in Classrooms," 26.
66. Straus, "Prodigious Hearing, Normal Hearing, and Disablist Hearing," 169.
67. Ibid.
68. The rhythm, music, and song are indigenous in the sense that they are native and occur naturally in Deaf culture. This is a concept similar to that of indigenous language, meaning a language that originated in a specified place and that was not brought to that place

from elsewhere. Indigenous Deaf music came from within the culture; it was not imposed by a dominant group of people.

69. Benjamin Bahan, "Face-to-Face Tradition in the American Deaf Community," in *Signing the Body Poetic,* ed. H-Dirksen L. Bauman, Jennifer Nelson, and Heidi Rose (Los Angeles: University of California Press, 2006), 36.
70. For a further understanding of linguistic properties that contribute to rhythm, see T. Supalla and E. Newport's "How Many Seats in a Chair? The Derivation of Nouns and Verbs in American Sign Language," in *Understanding Language through Sign Language Research,* ed. P. Siple (New York: Academic Press, 1978). The noun-verb pair has single and repetitive movement (which could account for the reason that one-two beats are common in Deaf songs), and Bahan explains that the three beats occur often with inflected signs, stressing an adjective or a verb. Benjamin Bahan, interview by author, May 7, 2009.
71. Padden and Humphries, *Deaf in America,* 78.
72. Peters, *Deaf American Literature,* 67.
73. Padden and Humphries, *Deaf in America.*
74. Bahan, "Face-to-Face Tradition in the American Deaf Community," 36.
75. Crider Loeffler personally recorded more than five different chants and protest songs that were used at different times during the 2006 "Unity for Gallaudet" protest.
76. Crider Loeffler has discovered a 1930 video clip of two Deaf couples signing the "Bison Chant," with a drummer in the background. This is long before Dorothy Miles wrote the "Bison Song," in 1960. This indicates that the song originated in sign language before it was translated into its current English version.
77. Brandon LaBelle, "Pump Up the Bass: Rhythm, Cars, and Auditory Scaffolding," *Senses and Society* 3, no. 2 (July 2008): 191.
78. Peters, *Deaf American Literature,* 69.
79. Alexander Pach, "With the Silent Workers," *Silent Worker* 35, no. 6 (1923): 228.
80. "Hearing people" refers to individuals who share the same auditory sensations. See Haualand, "Sound and Belonging," 115.
81. Ibid., 116.
82. Douglas Baynton, "Listening to Deaf Studies," introduction to Bauman, *Open Your Eyes,* 25. Bauman similarly puts emphasis on Deaf people as a "visual-tactile minority living in a phonocentric world." *Open Your Eyes,* 4.
83. To learn more about SignMark, see http://www.signmark.biz/site/en/home.
84. For a collection of music videos created by D-PAN (the Deaf Professional Arts Network), see http://www.d-pan.org/; and to view Rosa Lee Timm's works, see http://www.rosaleeshow.com/.
85. More examples can be found in Hansel Bauman's chapter on DeafSpace in this book.
86. More recently, the vibration vest was invented by Ann-Marie "Jade" Bryan, a Deaf African American woman featured on *America's Greatest Inventor.* See http://micascoop.blogspot.com/ for more information.
87. Peters, *Deaf American Literature,* 65.
88. Straus, "Prodigious Hearing, Normal Hearing, and Disablist Hearing," 167.
89. H-Dirksen L. Bauman and Joseph Murray, "Deaf Studies in the Twenty-First Century: 'Deaf-Gain' and the Future of Human Diversity," in *The Oxford Handbook of Deaf Studies, Language, and Education,* vol. 2 (New York: Oxford University Press, 2010).
90. While working as a Deaf studies teacher at the Texas School for the Deaf (TSD), Crider Loeffler discovered that several Deaf and hard-of-hearing students still play with rhythm and sign language to make their own songs. When asked where they learned to do this, they named Deaf camps and sports tournaments. In 2010, students hosted a nationwide spirit-song competition during the Hoy Baseball and Softball Tournament at TSD. This fact shows that even today, in the generation of iPod and music-video technology, this mode of creative expression is popular among Deaf schools.

26

DEAF GAIN AND CREATIVITY IN SIGNED LITERATURE

RACHEL SUTTON-SPENCE

Hold a tree in the palm of your hand,
or topple it with a crash.
Sail a boat on finger waves,
or sink it with a splash.
From your finger tips see a frog leap,
at a passing butterfly.
The word becomes the picture in this language for the eye.
—*Dorothy Miles, "Language for the Eye"*

What Is the Deaf Gain from Signed Poetry?

In her poem "Language for the Eye," Dorothy Miles highlights how sign-language poets use their bodies to present powerful visual images. Seeing and understanding how "the word becomes the picture" through a language of the eye is a major Deaf Gain to everyone who has experienced the limitations of spoken and written forms of language for creating images in poetry.[1] H-Dirksen Bauman and Joseph Murray have observed that the "unique visual and spatial properties of sign language make it a particularly rich medium for poetic image and metaphor."[2] Poets working with spoken and written forms of language use words to generate powerful visual images in the minds of their audiences; sign-language poets produce those visual images directly for the audiences to see.

Repeatedly, deaf studies scholars remind us that deaf people are "people of the eye."[3] Perhaps nondeaf people could also be people of the eye, if they took the time to notice what deaf people see and if they understood the essential grammar of visual communication as signers do. This chapter explores what theories of spoken language and literature can gain from that language and literature, despite the fact that sign languages have been maligned for centuries and that signed poetry was barely recognized as an independent art form until the 1980s.[4] I will draw on poems collected in British Sign Language (BSL),[5] but, as the overarching appeal of creative sign language comes from signers' ability to use the human body to present powerful visual images, similar examples can be found in any collection of signed literature and folklore around the world.

With signed literature, a textual gain arises through a modality gain, because the performance of a signed text creates multidimensional, kinetic text, showing

insights into literature that written, linear script cannot. Much of what we can learn from sign-language poetry comes down to acquiring a new literacy in poetry,[6] performance, and creativity. Nonsigners who become sign-literate find Deaf Gain in the delights of the art form.

Sign-language poetry shows the potential for human expression that goes far beyond a definition of language as a form of communication based on words, whether spoken and heard or signed and seen. It shows the weakness of the borders between language and "not-language." In 1973, the anthropologist Margaret Mead visited Gallaudet College and suggested that "sign language might be adapted and adopted as the language of universal diplomacy,"[7] as a consequence of which Dorothy Miles composed one of her best-known ASL/English poems, "To a Deaf Child." Although claims for the universal nature of signing are overstated (and "To a Deaf Child" is most certainly not easily understood by non-ASL signers), creative signing shows the potential for—and limitations of—signing for international communication. As a result, it can cause us to reassess ideas behind linguistic theory.

New Perspectives on Linguistic Theories

Signed languages have already presented challenges to theories of language that need to encompass visual as well as spoken languages.[8] However, creative sign language pushes signed languages so far beyond their normal boundaries that we need new ways to understand communication that strays so apparently effortlessly on either side of these boundaries.

Embodied Communication: Language beyond Words

Because signed languages are produced by physical gestures and perceived visually, it is no surprise that much of their vocabulary bears some visual relationship to the referent.[9] However, iconicity degenerates over time, so that what was once a visual representation of a referent becomes shorter, simpler, and increasingly conventionalized, with the result that signers use much of their vocabulary with no specific illustrative intent. For example, the ASL sign for HOME originally was signed as BED + EAT, but now it has evolved into a sign that cannot be understood by non-ASL signers. Consequently, it has been demonstrated repeatedly that sign languages do not form a single universal means of communicating,[10] and signers faced with a foreign sign language will struggle to follow its normal signed discourse.

Despite this challenge, it is essential to acknowledge that signers also sign with illustrative intent, and this is particularly apparent in strongly visual creative pieces. Dorothy Miles was making this point in her poem "Language for the Eye," quoted in the epigraph, as she encouraged audiences to see the powerful relationship between the signer's body, the signs produced, and their highly visual creative

potential. Her notes written for this poem suggest that it is "more effective when the signer is not speaking the descriptive lines at the same time."[11]

In creating these "highly iconic structures" of sign language,[12] signers use a range of strategies. They may take on the roles of characters, so that their hands and the rest of their bodies are mapped onto the bodies of the characters they are referring to, for example, where John Wilson takes on the role of Frankenstein in his poem "The Fates" so his hands represent Frankenstein's hands (see Figures 26.2c, 26.2d, and 26.2e). They may use their hands to represent the entire referent, employing what may be termed "whole entity classifiers," for example, in Paul Scott's poem "Tree," where his hands represent an entire dog and a blind man with his cane (see Figure 26.3). They may use the hands to sketch out the shape of the referent as a size-and-shape specifier, for example, where Donna Williams sketches the size and shape of the cat's ears and whiskers in her poem "My Cat" (see Figures 26.7a, 26.7b, and 26.7e). They may map a character's features onto most of the body while the hands represent a part of the body that a human does not have, using a "body-part entity classifier," for example, where Richard Carter's hands become the frog's feet in "Prince Looking for Love" (see Figure 26.1).[13] Many of these highly visual signs are produced—and understood—in their contexts by signers of any sign language.

Thus, we can see that, using the minimum of established vocabulary items, poets and storytellers can leave categorical language behind and move into a new form of visual-gestural creativity. Their performances, sometimes classed as the "visual vernacular" after a style identified by Bernard Bragg,[14] tend to appeal to international signing audiences, proving that the signing need not be from any particular sign language. However, the performances are not truly universal mime, because nonsigners struggle to follow them (and even some native signers feel challenged). These differences between artistic mime and creative signing that has gone beyond vocabulary can reveal some of the international or universal communicative possibilities for humans' ability to use their bodies to show concepts, and the importance of audiences' having the literacy skills needed to appreciate them.

Mime or Poetic Sign Language?

Signed poems must be performed in order to exist, and the blend of performance and poetic text calls into question the very idea that a poem can exist separately from its performance (challenging along the way the idea that language can be separated from its users).[15] Although it is possible to abstract some concept of a signed poetic text from its performer, we soon become aware of the artificiality of the distinction. When we discuss a signed poem, we are always describing the performance of that poem. A mime performance and a signed performance share many elements, because they are both embodied performances

delivering a message to an audience that possesses the literacy necessary to understand them.

To try to understand the differences between these two art forms, Penny Boyes Braem and I asked four BSL poets and four mime artists to devise performances based on the same subject material in their own artistic ways, and their outputs were compared.[16] There were many similarities in the performances by the two groups, some aspects of which can be traced to another type of performance: that seen through cinematic techniques. (A signed text or a mimed piece cannot be unequivocally separated from its performance, nor can the screenplay be unequivocally separated from the mise-en-scène of a film.) Both groups presented images and characters as though they were actors shown on a film screen, using techniques akin to close-ups and reverse shots. Cinema is known to have strongly influenced creative sign language and mime,[17] but we must note that performers can draw on these techniques successfully only because their signing and nonsigning *audiences* have a clear understanding of cinematic techniques, so that everyone has a shared frame of reference through which to understand the performances. If all audiences understood the grammar of signed art forms as well as they understand the grammar of cinema, the Deaf Gain would mean they could enjoy much more truly international communication in the way that deaf audiences do now.[18]

However, the two groups of artists differed markedly in the range of uses of their hands. The poets were far more likely to use entity classifiers (by representing the entire object on their hands), whereas the mime artists relied more on characterization to show actions and objects. Again, this can be attributed to the particular literacy skills of their audiences.

People use their hands to point, handle objects, and even represent objects in daily activities, and direct representations of these can all be used in sign languages.[19] For example, the fist can represent a round object in stone, the closed hand of a prisoner in prison, and the grasp of the steering wheel in car. Audiences need to know which meaning of the hand is intended, and nonsigners tend to interpret the hand as representing itself, perhaps because we most regularly experience the handling of objects.[20]

Audience's skills could also explain the observation that the mime artists used the whole stage for their performance, representing movement through space by their own path of movement, whereas the signers remained stationary and used movement of the hands to represent movement through space. Again, allowing for different physical skills of the performers, most of these differences in performance must predominantly be attributed to the differing abilities of audiences. Even in highly visual poetry, nonsigning audiences appear less attuned to the possibility that poets will be presenting actions or events on different scales. As they find it harder to know when a hand represents a hand, a foot, or an entire character, it is less easy to interpret the meaning of movement of that hand accurately.

Richard Carter's poem "Prince Looking for Love" refers to two frogs, one hand-

Figure 26.1. The position of body and hands and the facial expression provide cues that there are two frogs in Richard Carter's "Prince Looking for Love."

some and one ugly. Signing audiences immediately comprehend the different frogs from the signer's change in facial expression, body posture, and position of the hands, but when I showed the poem to some nonsigners who were inexperienced in watching signed poetry, they reported understanding that a single frog was experiencing changing emotions. Clearly, they were less inclined to view the signs as separate representations of the two frogs articulated within the same space (see Figure 26.1).

Signed poetry thus shows us how signers use their knowledge of sign language to create a nonverbal, visual performance that can be understood by audiences who know the essential conventions of this type of embodied language use. We may conclude that performances of signed poetry rely heavily on relevant literacy skills that the performers and their audiences have learned.[21] Deaf Gain will follow when nonsigners learn these literacy skills in order to understand and enjoy this art form.

Reassessing Traditional Linguistic Theories of Language Structure

Signed creativity obliges us to reconsider not only what language is but also theories used to understand language structure. As one example, signed poetry challenges theories of phonology. The fundamental "building blocks" of signs have long been understood to be found in their hand shape, location, movement, and finger and palm orientation. Although developments in the field have questioned how much these parameters correspond to phonemes in spoken language,[22] there is still a prevailing view (with plenty of evidence to support it) that many subsign parameters can be explained using theories of phonology (devised from spoken languages), as essentially meaningless elements combine to create meaningful signs. Linguists working in sign language have accepted the overwhelming

Figure 26.2. The same hand shape carries different meanings as Frankenstein creates his monster in John Wilson's "The Fates."

evidence for a distinction between established vocabulary and signs created using classifiers,[23] and it is clear that signs established in vocabularies fit conventional phonological theory better than the highly iconic structures seen in creative signing, which challenge the conventional theories of how languages are fundamentally structured.

Signing poets combine essentially meaningless parameters with more visually motivated elements to create a poetic effect of visual patterns and intricately complex meaning. Not only does this show potential for any poetry but it also challenges ideas of arbitrariness in sign constructions and broader issues of arbitrariness in language, thus providing Deaf Gain as it challenges once again our fundamental notions of what language is.[24] For example, the fluid but nevertheless inherent meaning of the hand shapes in signed poetry can be seen in the illustrations in Figure 26.2, from John Wilson's poem "The Fates," where curled five-fingered hand shapes occur repeatedly during a description of Frankenstein creating his monster. In the established BSL sign HORROR, the clawed fingers already metaphorically carry some of the negative connotations of the word in a way that may parallel ideas of sound symbolism in spoken languages; in the established sign DREAMING, the same hand shape has no such negative connotation, representing instead the hazy nature of dreaming. However, in this context, the dream starts to take on a more eerie quality, and the hand shapes take it on,

too. The creepy quality is reinforced by the highly visual productive signs PUT-ON-SURGICAL-GLOVES, REMOVE-TOP-FROM-SKULL, and PLACE-BRAIN-IN-SKULL, which are made by the hand shape representing Frankenstein's hands. There is little room in this sequence to argue for meaningless categorically distinct features, as different aspects of the signs' meaning are generated steadily through the context but are never arbitrary.

In another indication of Deaf Gain, pushing linguistic boundaries in signed poetry supports challenges to general linguistic theories of how to express grammatical concepts. Dan Slobin has observed that most theories about the structure of language have been formulated through extensive knowledge of many languages (mostly European, Semitic, East Asian, and West African languages), which appear very diverse but all share common underlying grammatical structures.[25] Understanding that other spoken languages (those from the Americas and Micronesia, for example) are structured very differently calls into question the universal application of existing theories. Speakers of European or Asian languages may find it hard to access languages such as Yucatec, Abkhaz, and Nootka, whereas signed languages may be easier to access for a range of reasons[26] and appear to show many of the same grammatical properties, giving further Deaf Gain as we understand more about the world's languages. Signed languages may show further differences because of their visual nature. Signed poetry, which shows signed languages at their most visual, can highlight real differences in grammatical structure of languages.

The two groups of languages highlighted by Slobin differ significantly in their morphology.[27] Because signed literature is frequently a rich source of new signs, we can measure theories of morphology against them. For example, entity-classifier hand shapes are established within each sign language, so it is possible to argue that the hand shapes constitute morphemes. Poets can create new entity-classifier hand shapes that are visually motivated and not part of the recognized set of "permitted hand shapes" within the language, yet audiences nevertheless understand them. Paul Scott's poem "Tree" pushes the language to its limits as he uses novel hand shapes for entity classifiers (Figure 26.3).[28] Linguistic theory needs to account for the way a master of signed poetry can extend the language

Figure 26.3. The right hand shows highly unusual classifier hand shapes in Paul Scott's "Tree."

a b c d e

Figure 26.4. The range of creatively different ways to indicate the number 3 in Paul Scott's "Three Queens."

without using morphemes to construct meaningful signs. It is not enough to argue that the poet strays outside the language and merely uses gestures.

Poetry also shows us different ways to think about the grammatical category of number. For example, Paul Scott's poem "Three Queens" indicates number, especially the number 3, in several imaginative ways, as we see in Figure 26.4. In Figure 26.4a, the number 3 is shown by counting to the numeral 3 on the left hand while the right hand has signed GIVE-BIRTH three times, to refer to the birth of three children; in Figure 26.4b, it is shown by using one entity classifier for two people and one for a single person, as three people walk in a particular formation; in Figure 26.4c, by indicating the third from many; in Figure 26.4d, by two manual signs representing two crowned queens on either side of the body (representing the third queen), to indicate three queens; and in Figure 26.4e, by signing LOOK-UP on each of the hands and looking up with the eyes, to indicate three people looking up. These examples demonstrate that the poems' powerful visual images and use of the body and hands can create new expressions for a concept that linguistic theories imply comes from established vocabulary or regular grammatical rules of morphology. All these examples challenge ideas about language structure derived from traditional linguistic theories, and signed poetry encourages us to look at language and meaning differently—another clear example of Deaf Gain.

Gesture, Meaning, and Contingency

Traditional ideas about language expect an arbitrary (or at least conventional) relationship between words and what they mean. However, many signs in poetry have no intrinsic meaning out of context but draw their meaning from their context, in turn helping to create the meaning of the subsequent sign. Alex Arteaga, considering embodiment and language, has drawn on existing ideas of "container" and "contigency." According to Arteaga's view, the body and language work together to contain the meaning they produce.[29] This process clearly occurs when a sign-language poet uses highly creative visual signing, and it is constantly medi-

ated by the audience, which works with the poet to understand what the poet is signing. The interaction between signer, signing, context, audience, and meaning illustrates what is happening in visual gestural communication and, through Deaf Gain, encourages us to think about how meaning can be made in language beyond spoken language as we normally understand it.

Figure 26.5. The established sign COCHLEAR-IMPLANT in Richard Carter's "Cochlear Implant."

Richard Carter's "Cochlear Implant" can illustrate this way of thinking about embodied language. In a section of this poem, the human character is tempted by an anthropomorphized cochlear implant that beckons to him to pick it up. Established vocabulary signs can, loosely, be seen as the containers for fixed meaning (in rough parallel with the way spoken words can be). The BSL sign COCHLEAR-IMPLANT (Figure 26.5) is a good container, as it is a single sign with an identifiable meaning associated with it. As a container, it has meaningful lines that create a closure and give it its form. In this case, the meaningful lines are the four parameters of the sign—the hand shape, location, orientation, and movement—and these construct the form that holds the meaning.[30]

When Carter signs the vocabulary item COCHLEAR-IMPLANT in the role of narrator, he uses the clawed "3" hand shape moving to contact at the fingertips above the ear, before taking the role of the human character, who looks down at the implant attachment in its box, shown using an entity classifier with the same hand shape. Then he takes on the character of the anthropomorphized cochlear implant, so that his hands, body, and eyes become those of the cochlear implant. At this stage, the hands still have the same clawed "3" hand shape, maintaining a shred of the original container sign. The last shred of the container fades away as the fingers wiggle and beckon enticingly, but the face and body that we have recently come to associate with the previous hand shape remain. The human character's hand reaches down to pick up the cochlear implant, and the poet-performer places his hand over his whole face to grab it. Now the hand represents the hand of the human character in the story, and the head and face have become the entire cochlear implant. We know this through the thread of the story because the position of the face and body was set up when the cochlear implant was first personified. All this may be seen in Figure 26.6. In Figure 26.6a, the poet takes the role of the human who looks at the implant, which is shown by a whole entity classifier with clawed "3" hand shape on one hand; in Figure 26.6b, the character of the implant holds its own hands in clawed "3" configuration; in Figure 26.6c, the implant beckons with a relaxed "3" hand shape; in Figure 26.6d, the implant beckons with a more human-shaped "5" hand shape; in Figure 26.6e,

a b c d e f

Figure 26.6. Signs showing the appearance and behavior of the human and implant in Richard Carter's "Cochlear Implant."

the poet becomes the human character who reaches for the implant; and in Figure 26.6f, the poet's hand represents the human's hand that picks up the implant, as represented by the poet's head.

All this meaning is a result of contingency, not container. These signs have no container; they are not bounded by meaningful lines as they merge and blend with each other. Each subsequent sign is a choice that the signer makes based on parts of what has come before, and each has the potential to generate the meaning we give it because something has occurred previously. What we see as the cochlear implant's face and hands was set up by the containered sign COCHLEAR-IMPLANT. Thus, when we come to understand sign-language poetry, we cannot establish a clear causality between the contingent elements (that is, we can't say that a given sign means *x* because of the previous sign), but we can see a clear connection between the elements and their meanings.

We see again that performance, text, and the audience's interpretation are inextricable.[31] As we understand the mechanics of this process, Deaf Gain helps us understand meaning making quite differently from any process speakers have experienced before. For audiences of poetry, the development of this literacy is a Deaf Gain for everyone who can enjoy these performances. This contingency is something that nonsigners accustomed to the idea that a word contains meaning need to learn.

The Cautionary Tale of "The Devil Cat with Feathers"

"My Cat," a charming poem by Donna Williams, tells how, after the death of her old cat, the poet found a deaf cat to adopt. The strongly visual poem, performed in 2012, used barely any established vocabulary and delighted her mixed audience of ASL and BSL signers, who all understood it clearly. A hearing nonsigner present reported afterward that she had greatly enjoyed it but was a little confused: why had the cat turned into a devil and grown feathers? Given the visual input, this was not an unreasonable interpretation of the signs in the poem (see Figure 26.7 and Williams's poem at http://www.signinghandsacrossthewater.com/). We can see in Figures 26.7a and 26.7b signs sketching out the cat's pointed ears, misin-

terpreted as sketching horns. In Figures 26.7c and 26.7d, signs sketching fur were misinterpreted as sketching feathers. In Figure 26.7e, the sign sketching whiskers was misinterpreted as sketching a Mephistophelian mustache. In Figure 26.7f, the poet's hands representing the cat's legs were misinterpreted as the devil's horns, and in Figures 26.7g and 26.7h, the role taken of the cat snarling and scratching was misinterpreted as the devil snarling and lunging.

The problem lay in understanding the unfolding meaning, as the nonsigner had missed the crucial indication that the poet was looking at several cats. Further, once she had settled on the idea that the devil was under discussion (the cat had clearly died, so the appearance of the devil after a death is not unexpected), the nonsigner did her best to use what contingency chain she could. Her feedback was valuable to poets, interpreters, researchers, and ultimately, we hope, to future audience members, as it highlighted this intriguing potential for Deaf Gain. (Shortly after this misunderstanding, Williams composed a poem titled "The Devil Cat.")

From these observations of how creative signing can enrich our ideas about the extent and structure of language, I now turn to how it can enrich our ideas about poetry.

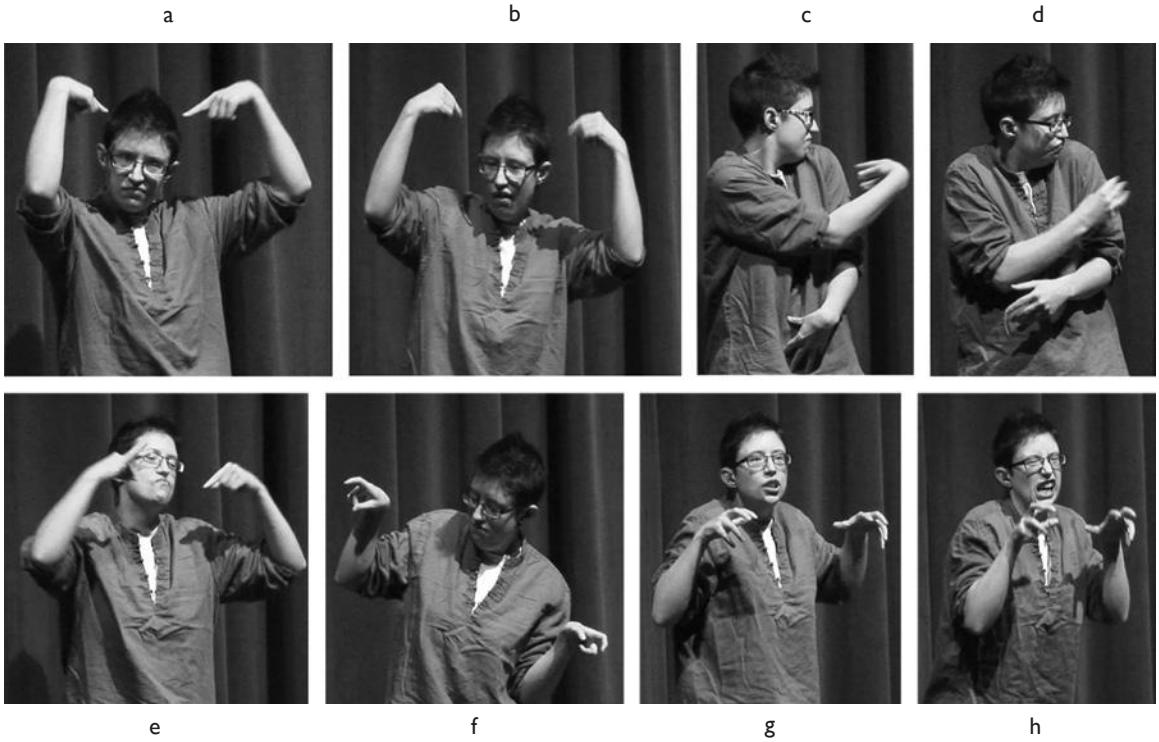


Figure 26.7. Signs showing the appearance and behavior of the cat in Donna Williams's "My Cat."

How Visual Language Can Contribute to Poetic Meaning

Poets seek to push the boundaries of their art, but most are constrained by the auditory nature of spoken poetry. Poets hoping to create powerful images through their language can find extraordinary potential for expression in the visual modality of signed poetry. As Bauman has shown so clearly, signed poetry lies at the intersection of language art, visual art, and cinematic art.[32] Although written poetry allows us to separate poems from poets, signed poetry foregrounds the relationship between the poem and poet, so that a Deaf Gain is for poets and audiences to reclaim the personal within poetry. Jennifer Nelson has shown how signed poetry blends language and the body inextricably,[33] and Heidi Rose also addresses this idea to show that signed literature is a literature of the body and of performance.[34] Understanding the devices used by signing poets to create their poetic effects can teach us more about the potential for manipulating language in a range of media to add poetic meaning.

Poets who compose written poems make use of the resources available to them through different characteristics of the medium. Those who present their poems on the page or the screen have options such as placing words in the two-dimensional space; playing with different fonts and font sizes, the shape and configuration of letters, and so on; and manipulating the shape of the written poem on the page, as is amply shown by concrete poetry. With graphics packages they are able to make the words move and their visual appearances change. Written words can be used with and embedded in pictures. Poets can also draw on the resources in their writing systems. For example, Japanese haiku poets can use combinations of kanji, hiragana, and katakana to create different impressions in written poems.[35] Chinese-origin logographs (kanji) are visually very complex, whereas the hiragana and katakana Japanese characters are simpler and less visually dense, so poets can draw on the different visual appearance of the writing styles, using an option not available to writers using the Roman alphabet. Although these are numerous options for written poetry, the options available to signing poets through the visual embodied medium tell us even more about poetry as an art form in general.[36]

Metaphors: Reflections about the Body

Poetry and metaphor are intricately linked in many cultures, and signed poetry is frequently rich in metaphor. Poetry seeks new ways to express the human condition, and this is often through novel uses of metaphor. As we noted at the beginning of this chapter, the embodied nature of sign language offers entirely new ways to present metaphors, because signing poets use their bodies to express them, including spatial and orientational metaphors that may include ideas of balance and opposition. These metaphors, which may be powerful when expressed through words in spoken and written language, are made even stronger, more

a b c d

Figure 26.8. Signs placed in space to directly show metaphors in Donna Williams's "Who Am I?"

direct, and more real in creative sign language. The signer makes them real by drawing on the available physical space (left space, right space, and the dividing/binding axis, as well as higher space, lower space, and the dividing/binding axis) and by using the articulating human form (left hand, right hand, and the dividing/binding human body).

Donna Williams's poem "Who Am I?" considers the divided sense of identity of a deaf person brought up within hearing culture, and uses the two hands across signing space and the body to represent and explore the divided sense of identity. The poet's body is the central divided location of her fractured self, and her two hands contrast deaf and hearing identities to her left and right. At one stage she signs DEAF with her right hand and HEARING with her left hand, holding both signs on her body simultaneously to show her simultaneous conflicting identities (Figure 26.8a). As she considers her disparate deaf and hearing identities, she places the signs for each far to the right and left (Figure 26.8b). As she considers how they can be reconciled, they are brought closer together and closer to her body, and finally she places the hands representing the two identities next to each other toward her body (Figures 26.8c and 26.8d), finally creating a whole self. The poet's body thus provides fresh, direct expressions of well-established metaphors such as "Abstract concepts are concrete entities," "Concepts of opposing meaning are in opposing space," and "Concepts that are very different are objects far apart." It is part of Deaf Gain to see these ideas presented visually rather than merely in words, and expressed bodily so that we can understand these metaphors in a new, direct way and perhaps understand more fully how to feel those metaphorical ideas through bodily experience.

Hiding the Visual in Plain Sight

As we saw with "My Cat," one result of creating meaning through the chain of contingencies is that signed poetry easily leads us to imagine we see things that

Figure 26.9. The tree shown and the tree imagined in Paul Scott's "Tree."

we are not shown. Poets can exploit this tendency. Once we have seen an image, we retain it and build it into the larger tableau even when it is no longer there. Paul Scott's "Tree" presents a tree with his right hand in its location on the ground, shown by his left hand. After that, the right hand signs many things, always in relation to the tree, which, despite its visual absence, fills the space in the audience's mind. Figure 26.9 shows the tree in its location and then a blind man approaching it. The illusion of the tree's presence is extremely powerful, as the other signs encourage us to retain the image.

This device also makes us vulnerable and allows poets to play further with our assumptions of what we have been told. In Johanna Mesch's poem "Party," a deserted fiancée is seen plunging a knife into her chest, but then, apparently inexplicably, she rises again triumphantly. The glorious moment of peripeteia uses a trick hidden in plain view of us all and possible only in sign language (shown in Figure 26.10). It draws on our common understanding in sign languages that a handling classifier implies the presence of something held that we are not shown. As we see the fiancée cutting bread, the handling classifier shows holding the knife handle,

Figure 26.10. The sign representing handling the knife, implying that the blade faces away from the body in Johanna Mesch's "Party."

and we know where the blade is because our imagination correctly fills in its location from our understanding of where the bread is and how the fiancée fingers the blade thoughtfully. When the woman appears to stab herself, the poem tricks us into imagining the position of the knife blade where it is not. Careful focus on the contingency chain of the meaning of the signs through the poem reveals that the orientation of the handling classifier means the knife blade is pointing *away* from the character. She merely hits her chest with the knife's handle, but we see her stabbing herself because that is what we expect to see. The audience is fooled; the heroine rises in triumph over her despair, and sign language has turned our expectations upside down.

Anthropomorphism: Metamorphosis and Transformation through Embodiment

Stories and poems often present the familiar as unfamiliar to challenge us all. Cynthia Peters's excellent wide-ranging study of Deaf American literature has highlighted the carnivalesque nature of sign-language stories and poems, in which defamiliarization challenges hierarchies, reverses roles, and turns worlds upside down.[37] Within Bakhtin's ideas of the carnival is the understanding that accepted truths are tested and contested. The carnivalesque content of signed literature and folklore shows the current social order as merely one truth or established reality among many. When we anthropomorphize a nonhuman, the world is shown from a defamiliarized, "reversed" perspective to challenge the accepted position of audiences.

Anthropomorphism pervades signed creativity, perhaps because deaf people are so often defined by hearing people as "other," and also because signers use their bodies to represent bodies of nonhumans in ways not possible in spoken languages.[38] Spoken-language literature can talk about the perspective of nonhumans, but it cannot directly show it; signers become "the other" directly by turning themselves into the things they want to describe. Nonsigning audiences greatly appreciate this signed art form as something that spoken and written poetry cannot do.

Ideas of transformation in storytelling go back at least to the Ancient Greek tradition, where storytelling represented part of the divine ability to change form. Ovid's *Metamorphoses* is a crucial classical source for myths containing many examples of transformations, as humans are turned into birds, animals, and trees, and nonhumans become human. When Daphne is transformed into a laurel tree, her transformation is described with a physical mapping between the form of a tree and the form of a human. Skilled signers develop these ideas further so that it is no longer just a divine trait to change form but an expression of human creativity, and one at which sign language allows performers to excel.

Storytellers regularly take on the roles of characters and aspects of transforma-

a b

Figure 26.11. The poet's body mapped onto (*a*) a human teacher in "Owl" and (*b*) a bear in "Sam's Birthday," both by Richard Carter.

tion and metamorphosis fundamental to all storytelling. Although, as Peters has observed, speakers do use gestures, body shift, and mimicry to support a spoken-language message that tells the story,[39] signers naturally shift between narrator and character through constructed action and constructed speech in order to tell what something looked like and to show it.

Signers use the device of constructed action (also termed "role shift" and "characterization") to map themselves onto others. It is scarcely noticeable when signers map another human onto their body, because there is a perfect one-to-one physical match between the signer and the represented human (see Figure 26.11a for a representation of the cruel teacher in Richard Carter's "Owl"). When they map nonhuman entities onto their body, signers give them eyes, a mouth, head, hands, and so on, because the signer, too, has these features. Animals (especially with forms similar to the human form) are most commonly anthropomorphized, and signers-as-animals may often use sign language to comment on their perspective of the world (see Figure 26.11b for the representation of a magical signing bear in Richard Carter's "Sam's Birthday").

In a specific genre of signed literature, plants, natural phenomena such as mountains and rivers, and other inanimate objects take human form but usually express only emotional reactions to their experiences. In this genre, nonmanual features are foregrounded, as poets portray personified inanimate objects that cannot communicate with their hands (essentially because they don't have any). Instead, these objects communicate their feelings and desires nonmanually (see Figure 26.12 for the representation of a cold, wet mountain that sprouts vegetation from its slopes in Paul Scott's "Too Busy to Hug, No Time to See").

Richard Carter's "Mirror," in this genre, provides a fine example of what we can learn from defamiliarized deaf images, because he shows the world as the mirror sees it. It is the world seen through a looking glass but with a true re-

Figure 26.12. Poet's hands represent a mountain while the nonmanuals anthropomorphize it in Paul Scott's "Too Busy to Hug, No Time to See."

versed perspective, because it is seen from the other side. We all have prototypical schemata about who acts and who or what is acted on—usually seeing inanimate objects as things that humans act on—but anthropomorphism in signing reverses these positions in entertainingly deviant ways. We know that we look into mirrors, but this poem reverses the roles so that the mirror looks out at us and the looking glass becomes a glass that literally looks. This is made especially clear by the visual medium of the poem, because the eyes are the lead articulators in the narrative. Whenever he portrays the mirror, the signer's flat hands are held parallel with the body to represent and emphasize its flatness, and the mirror's emotions and reactions to human behavior are shown almost entirely nonmanually (see Figure 26.13). Our understanding of our position in the world with respect to others is turned inside out when we see vanity, discomfort, and loneliness in the mirror's face. Although we think of a mirror as a visual object (it is, after all, a looking glass), the embodied anthropomorphism in the poem invites us to think about its feelings as well, as we see its responses to touch and its inner emotional life. All this is shown rather than told to us, and it is communicated without manual articulators, which are normally considered the source of lexical information.

This brings us back to the role of signed creativity in our understanding of linguistic theory and the relationship between this nonverbal signing and mime. Nonmanual elements have a problematic status within linguistic theoretical frameworks, because facial expression gives linguistic and paralinguistic information in a way similar to intonation in spoken languages.[40] "Mirror" uses the torso, face, head, mouth, and eyes to carry a story that shows the mirror's experiences. This very entertaining poem shows the potential for nonmanual features to contribute to the communicative message as they work together to perform different grammatical roles. Yet, returning to our consideration of mime, "Mirror" differs

Figure 26.13. Nonmanual anthropomorphization of the mirror in Richard Carter's "Mirror."

from the corporeal mime advocated by artists such as Étienne Decroux,[41] because the poem uses the body to show the emotions as part of the contingency chain that also uses manual, lexical signs.

Creative Signing and Deaf Gain

This has been a necessarily brief and selective review of some of the contributions signed literature can make to theories of linguistics and poetry. Repeatedly, the highly visual expression that goes well beyond the formal structures of a visual language shows new ways of thinking about language, literature, and performance. As we come to understand the relationships between the unfolding context of the creative works and their meaning, we know what we need to understand to truly appreciate the extent of human creativity and the potential for clear human communication. Signed literature offers everyone a new source of pleasure and entertainment, and perhaps, all the other instances of Deaf Gain presented here notwithstanding, that alone is enough to promote its Deaf Gain for "making

vital contributions to the greater good of society."[42] As Peter Cook, an ASL performance poet has said, "Let the words become pictures. That's what we do in ASL poetry."[43]

Notes

I am grateful to Richard Carter, John Wilson, Paul Scott, Donna Williams, and Johanna Mesch for their kind permission to use their poems, and to the late Don Read for permission to quote freely from the written work of Dorothy Miles. I am greatly indebted to Alex Arteaga from the Collegium for the Advanced Study of Picture Act and Embodiment at the Humboldt University, Berlin, for his help in my thinking about container and contingency, and to Donna Jo Napoli and Gillian Rudd and the editors of this volume for their helpful comments on earlier drafts.

1. Miles wrote this poem specifically in order to describe sign language to hearing children, clearly intending that sign language was something from which they could benefit.
2. H-Dirksen L. Bauman and Joseph J. Murray, "Deaf Studies in the Twenty-First Century: 'Deaf-Gain' and the Future of Human Diversity," in *Oxford Handbook of Deaf Studies, Language and Education,* ed. Marc Marschark and Patricia Spencer (Oxford: Oxford University Press, 2010), 2:219.
3. Harlan Lane, Richard Pillard, and Ulf Hedberg, *The People of the Eye: Deaf Ethnicity and Ancestry* (Oxford: Oxford University Press, 2011); George Veditz (1910), cited and discussed in depth in Michael Gulliver, "DEAF Space, a History: The Production of DEAF Spaces Emergent, Autonomous, Located, and Disabled in Eighteenth and Nineteenth Century France" (doctoral diss., University of Bristol, 2009); Rachel Locker McKee, *People of the Eye: Stories from the Deaf World* (Wellington, New Zealand: Williams Books, 2001).
4. H-Dirksen L. Bauman, Jennifer Nelson, and Heidi Rose, introduction to *Signing the Body Poetic: Essays in American Sign Language Literature,* ed. H-Dirksen L. Bauman, Jennifer Nelson, and Heidi Rose (Berkeley: University of California Press, 2006), 1–20.
5. These poems are available at http://www.bristol.ac.uk/bslpoetryanthology.
6. Marlon Kuntze, "Turning Literacy Inside Out," in *Open Your Eyes: Deaf Studies Talking,* ed. H-Dirksen L. Bauman (Minneapolis: University of Minnesota Press, 2008), 146–57.
7. Dorothy Miles, *Bright Memory: The Poetry of Dorothy Miles* (Feltham, U.K.: British Deaf History Society, 1998), 76.
8. See, for a range of examples, Diane Brentari, ed., *Sign Languages* (Cambridge: Cambridge University Press, 2010).
9. Mark Mandel, "Iconic Devices in ASL," in *On the Other Hand,* ed. Lynn Friedman (New York: Academic Press, 1977), 57–108.
10. Edward Klima and Ursula Bellugi, *The Signs of Language* (Cambridge, Mass.: Harvard University Press, 1979).
11. Miles, *Bright Memory,* 83.
12. Christian Cuxac and Marie-Anne Sallandre, "Iconicity and Arbitrariness in French Sign Language: Highly Iconic Structures, Degenerated Iconicity, and Grammatic Iconicity," in *Verbal and Signed Languages: Comparing Structure, Constructs, and Methodologies,* ed. Elena Pizzuto, Paola Pietrandrea, and Raffaele Simone (Berlin: de Gruyter, 2008), 13–33; Marie-Anne Sallandre, "Simultaneity in LSF Discourse," in *Simultaneity in Signed Languages,* ed. Myriam Vermeerbergem, Lorraine Leeson, and Onno Crasborn (Amsterdam: Benjamins, 2007), 103–26.
13. There is an excellent summary of these processes in Trevor Johnston and Adam Schembri, *Australian Sign Language (Auslan): An Introduction to Sign Language Linguistics* (Cambridge: Cambridge University Press, 2007).
14. See Tom Riggs, *Visual Vernacular Storytelling in ASL* (East Bend, N.C.: Signs of Development, 2003), DVD, accessed February 1, 2013, http://www.signs-of-development.org/; and

Aya Kinoshita, "Two Cameras and American Sign Language Storytelling: Visual Vernacular, Video Recording, and the Body" (master's thesis, Hunter College, City University of New York, 2005).

15. Heidi Rose, "The Poet in the Poem in the Performance: The Relation of Body, Self, and Text in ASL Literature," in Bauman, Nelson, and Rose, *Signing the Body Poetic,* 130–46.
16. Rachel Sutton-Spence and Penny Boyes Braem, "Comparing the Products and the Processes of Creating Sign Language Poetry and Pantomimic Improvisations," *Journal of Nonverbal Behavior* 37, no. 4 (2013): 245–80.
17. H-Dirksen L. Bauman, "Redesigning Literature: The Cinematic Poetics of American Sign Language Poetry," *Sign Language Studies* 4 (2003): 34–47; H-Dirksen L. Bauman, "Getting Out of Line: Toward a Visual and Cinematic Poetics of ASL," in Bauman, Nelson, and Rose, *Signing the Body Poetic;* Riggs, *Visual Vernacular Storytelling in ASL;* Kinoshita, "Two Cameras and American Sign Language Storytelling"; Thomas Leabhart, *Modern and Postmodern Mime* (New York: St. Martin's, 1989).
18. This is also true of mime, which has its own conventions, as is made clear by Charles Aubert and Thomas Leabhart and Franc Chamberlain with reference to the work of Étienne Decroux. Audiences familiar with the conventions will perhaps invest more effort in understanding and thus find mimed performances more rewarding. Charles Aubert, *The Art of Pantomime* (1927; repr., New York: Blom, 1970); Thomas Leabhart and Franc Chamberlain, eds., *The Decroux Sourcebook* (London: Routledge, 2008).
19. Paola Pietrandrea and Tomasso Russo, "Diagrammatic and Imagic Hypoicons in Signed and Verbal Language," in Pizzuto, Pietrandrea, and Simone, *Verbal and Signed Languages,* 35–56.
20. Penny Boyes Braem, Elena Pizzuto, and Virginia Volterra, "The Interpretation of Signs by (Hearing and Deaf) Members of Different Cultures," in *Progress in Sign Language Research / Fortschritte in der Gebärdensprachforschung,* ed. Rolf Schulmeister and Heimo Reinitzer (Hamburg: Signum Verlag, 2002), 187–220.
21. It is important to note that signers also need to learn signed-poetry literacy. See Karen Christie and Dorothy Wilkins, "A Feast for the Eyes: ASL Literacy and ASL Literature," *Journal of Deaf Studies and Deaf Education* 2 (1997): 57–59.
22. Robert Johnson and Scott Liddell, "Toward a Phonetic Representation of Signs: Sequentiality and Contrast," *Sign Language Studies* 11 (2010): 241–74; Robert Johnson and Scott Liddell, "A Segmental Framework for Representing Signs Phonetically," *Sign Language Studies* 11 (2011): 408–63; Robert Johnson and Scott Liddell, "Toward a Phonetic Representation of Hand Configuration," *Sign Language Studies* 12 (2011): 5–45.
23. Adam Schembri, "Rethinking 'Classifiers' in Signed Languages," in *Perspectives on Classifier Constructions in Sign Languages,* ed. Karen Emmorey (Mahwah, N.J.: Erlbaum, 2003), 3–34; Johnston and Schembri, *Australian Sign Language (Auslan);* Cuxac and Sallandre, "Iconicity and Arbitrariness in French Sign Language."
24. Scott Liddell, "Modality Effects and Conflicting Agendas," in *The Study of Signed Languages: Essays in Honor of William C. Stokoe,* ed. David Armstrong, Michael Karchmer, and John Vickery van Cleve (Washington, D.C.: Gallaudet University Press, 2002), 53–84.
25. Dan Slobin, "Breaking the Molds: Signed Languages and the Nature of Human Language" (paper presented at "Revolutions in Sign Language Studies: Linguistics, Literature, Literacy" conference, Gallaudet University, Washington, D.C., March 22–24, 2006).
26. Signed languages may be easier to access, not least, because in most countries a deaf community uses its own sign language but its members are bilingual in sign language and the language of the surrounding hearing community (and thus probably the language of the linguistic researcher).
27. Morphology analyzes the internal structure of words. A morpheme is understood in linguistics as being the smallest unit of meaning in a language.

28. Rachel Sutton-Spence and Donna Jo Napoli, "How Much Can Classifiers Be Analogous to Their Referents?," *Gesture* 13, no. 1 (2013): 1–27.
29. Alex Arteaga, personal communication with the author, Swarthmore College, October 2011.
30. We should note, however, that a cochlear implant and its perception in deaf communities are cultural issues that compound linguistic understanding. This complicates access to the meaning of the visual form. Nonsigners who know nothing about deaf lives may not even know what a cochlear implant is, even if they have full access to the message.
31. An audience may not make these links overtly. The humor and meaning can come across, but an audience doesn't need to be aware of this level of detail to understand and even appreciate what is going on. It is the role of analysis to point out the mechanics.
32. Bauman, "Getting Out of Line."
33. Jennifer Nelson, "Textual Bodies, Bodily Texts," in Bauman, Nelson, and Rose, *Signing the Body Poetic,* 118–29.
34. Rose, "The Poet in the Poem in the Performance."
35. Masako Hiraga, "How Metaphors and Iconicity Are Entwined in Poetry: A Case in Haiku," in *From Sign to Signing: Iconicity in Language and Literature,* ed. Wolfgang G. Müller and Olga Fischer (Amsterdam: Benjamins, 2003), 317–35; Masako Hiraga, *Metaphor and Iconicity: A Cognitive Approach to Analysing Texts* (Basingstoke, UK: Palgrave Macmillan, 2005).
36. We could also explore the options for spoken-performance poetry, which enable poet-performers to produce many more, different effects.
37. Cynthia Peters, *Deaf American Literature: From Carnival to the Canon* (Washington, D.C.: Gallaudet University Press, 2000).
38. Rachel Sutton-Spence and Donna Jo Napoli, "Anthropomorphism in Sign Languages: A Look at Poetry and Storytelling with a Focus on British Sign Language," *Sign Language Studies* 10 (2010): 442–75.
39. Peters, *Deaf American Literature.*
40. Svetlana Dachkovsky and Wendy Sandler, "Visual Intonation in the Prosody of a Sign Language," *Language and Speech* 52 (2009): 287–314; Connie de Vos, Els van der Kooij, and Onno Crasborn, "Mixed Signals: Combining Linguistic and Affective Functions of Eyebrows in Questions in Sign Language of the Netherlands," *Language and Speech* 52 (2009): 315–39.
41. Leabhart and Chamberlain, *The Decroux Sourcebook.*
42. Bauman and Murray, "Deaf Studies in the Twenty-First Century," 210.
43. Peter Cook, *The Heart of the Hydrogen Jukebox,* directed by Miriam Nathan Lerner and Don Feigel (Rochester, N.Y.: Rochester Institute of Technology, 2009), DVD.

27

DEAF GAIN AND THE CREATIVE ARTS

Interviews with Deaf Artists

JENNIFER GRINDER WITTEBORG

Twelve Deaf artists were interviewed for this chapter, many of whom wear different artistic "hats" in various fields: Wayne Betts Jr. (filmmaker); Peter Cook (storyteller and video producer); Patti Durr (filmmaker, playwright, and mixed-media artist); Monique Holt (actor, translator, director, and writer); Camille Jeter-Lorello (actor, storyteller, and translator); Jonathan Kovacs (actor); Michelle McAuliffe (multimedia artist); Nancy Rourke (Deaf View/Image Art [De'VIA] artist); Christine Parrotte (multimedia artist and Web designer); Jon Savage (actor, filmmaker, and pop artist); Ethan Sinnott (director, scenic designer, translator, and professor); and Louise Stern (artist, writer, performer, and playwright). The artists were asked two questions. Some wrote their answers, and others answered in American Sign Language (ASL); the latter responses were then translated into English and are enclosed in quotation marks here.

How do you feel that being Deaf has given you insights, perspectives, and advantages in your field of artistic practice?

JON SAVAGE "I want to say no, that this 'gain' or advantage is not because I am Deaf, it is Jon's gain. Everything I am interested in goes into the 'bag' that I talked about before. That's my bag. For another Deaf person, his or her bag is different from mine.

"Yet again Deaf Gain is based on what I am fascinated with. Maybe a hearing person next to me will not totally understand what I am fascinated by. I assume that hearing person will absorb about 50 percent sounds and 50 percent visual from the world around, while I am wholly, 100 percent absorbed by the visual world around me.

"I grew up as a quiet boy who was completely visual observant because I didn't have the ability to express myself. So I collected visual experiences and observation. Then someone asked me, 'What do you want to do in your future?' I took a look in my bag, and whoa! I took things out of my bag to play with and created my

work. The reaction from people was, 'Wow, where did you get those ideas?' It's all based on what I saw growing up."

MICHELLE MCAULIFFE "Deaf since birth, I have faced hurdles all my life. This experience has undoubtedly instilled me with a unique aspect of life. This is certainly something that a hearing artist, if never introduced, would not be aware of. One of the greatest advantages, which I am truly grateful for, is my ability to 'see.' Am I able to 'see' what's around me better than the average hearing artist because I rely heavily on my sight? Possibly.

"Intuition is also another 'gain.' Even though my parents started me out as an oralist, I developed a multiplicity of approaches to my deafness, communication, and views of my world over the years. Mainly, this was due to my experiences within various educational systems. During my elementary education, I was the only deaf student at the school and did not have any assistance with the information presented or other classroom communication. While I wore hearing aids, my time in the classroom was mainly spent trying to lipread what the teacher and students were saying. If students would talk or ask and answer questions, it was lost on me. Being the curious person I was and still am, I was motivated to observe what was happening around me so I could figure out what was happening. In other words, I was a young Jedi learning how to use my intuition. I became more sensitive to my everyday environment. I became more aware of where my intuition would lead me. Later in life, I learned that it was one of the greatest tools that I could apply to my work."

WAYNE BETTS JR. "We Deaf people are lucky. Yes, we're a minority group, but we have our culture, our signs, which is different in that it is visual-based. We can contribute to the hearing filmmakers who are highly competitive in this cutthroat business within the film industry. They tend to focus on the sound quality and technical editing. For us Deaf people, it's easy. We look at what looks right and natural within the realm of visual experience. When we present this perspective to the hearing filmmakers, they then see how we're more visual centered—not sounds.

"For example, let us suppose the hearing filmmakers edit some cuts that are quick and rapid. They must use sounds to softly carry the viewer through the edited parts that make it pleasant. If there were no sounds to carry the hearing viewer through, the edited film would look 'off,' because the edited visual aspects do not make visual sense. We Deaf filmmakers can contribute on how to make visual music for the eyes to carry the viewers softly and smoothly through the film. We do not need sounds—we know how to work for the eyes. We Deaf filmmakers can contribute to that expertise. There are many other similar contributions that we can explore within the filmmaking industry.

"What are the differences between hearing and Deaf filmmakers? Deaf filmmakers have struggled trying to conform to the traditional film-school methodology. This methodological presentation of storytelling (most always being a three-act construction with character introduction) is in written form. Now taking a second to look at Deaf storytelling styles as if we were sitting around chatting near a fireside or something—totally different structure. There aren't any three acts or any of that. Our Deaf storytelling structure is more of an 'apex' shape, like a pyramid with a starting point, and going from that point on with additional details. Hearing filmmakers' storytelling style is more of an inverted pyramid, where the plot gradually becomes clearer and ends at an apex: the point of the story. These are two drastically opposite ideologies/storytelling methods. That's what is so different between Deaf and hearing filmmakers."

CAMILLE JETER-LORELLO "National Theatre of the Deaf (NTD) has a motto: 'You see and hear every word'—sound and sight combined within one. *(looking at her hands)* Our hands with ASL are like magic: they accurately express whether you sign something on your right side, or sign something on your left side with your left hand . . . or together! And in the theater, I have the advantage of using my language—and I am able to not just analyze the language but the character, too. Each character signs differently according to the personality embodied.

"Now for example, Molière was a French farce playwright. One of his plays, *The Italian Straw Hat,* was a lot of fun, because we played with the language. One of Molinari's scripts translated into English tended to play with words, depending on the sound of the words. This gave us the opportunity to take advantage of that and translate that into dramatic expressions. The script has the character asking, 'Why, Why, WHY?' (Camille signs this out with the last 'why' hand moving from normal face level to the floor with a dramatic flair.) The audience could really relate and connect to the expressed idea/concept. That was really thrilling.

"For more than fifteen years, I worked as an actor, art director, in professional theater operation, and all that within NTD. I look back on how it really inspired me, and that's where I turn out to *be* who I am! I am proud of it, and ASL is beautiful! *(laughs)* Deaf actors' sense of space and what advantages we have are awesome! Sense of space—well, we're visual. And being visual, I can walk, see, and embody images. If I were to tell you a story, I can see images in my mind, and it all comes out flowing in my hands and body. Even children will be enthralled. I am a skilled storyteller, and I have told stories for many years. Not one kid became restless during my stories. That means something. All storytellers must have that talent—keeping the audience captive, on the edge of their chairs, watching every move I make, every sign and facial expression, and I even create images for them to see, even though it is not actually there. That is an amazing ability with ASL: we can play with hands, body, and faces and all that."

JONATHAN KOVACS "As an artist, Deaf people have more advantages as a group, because they're visual. Just like a hearing person will detect a specific sound amidst sound overload, Deaf people will detect a specific visual aspect amidst visual overload. That's our big advantage. As the saying goes, 'A picture is worth a thousand words.' We're masters in the visual field; hearing people are masters at sounds. Deaf people, being Deaf, have learned to use our eyes and have a deeper understanding. Nothing is a loss, as everyone is whole. Lack of a few things forces you to move towards new directions. If you cannot go up, you'll then go down; if you can't go down, then you'll go up. We don't hear anything, so we become more visual. That's a big gain—a huge gain."

LOUISE STERN "I see the urge to communicate as being at the very center of what makes us human. Being Deaf forces this urge to the surface of your life, day in, day out. This can lend itself to an urgency and a potency that can feed into artistic practice."

ETHAN SINNOTT "I think you've asked me a question that is not easy to give a straight answer to and be done with it. The answer is more of senses, embodied senses shaped by each Deaf person's background. My background is being the only Deaf person in a mainstreamed program with all hearing people around me. Of course, the fact that I grew up alone wandering among hearing people for years influenced my art. I do not think in terms of Deaf within the world. When I create art, I am not thinking of the Deaf community or what am I saying as a Deaf person. It's more of a . . . *(long pause)* my embodied sense of my interpretation of the world defined as a Deaf person within the hearing people surrounding me. In some ways, that sense carries over to my work as a theatric stage designer now, where I work with hearing people outside Gallaudet University (where I teach). My stage style of designing tends to be based on the fact that I have never liked static stage design.

"As a stage designer and director, I believe in using the whole space, not just the front, limited, small part of the stage with a background prop, having actors move in front of it. I want to use behind the background prop and have people moving among the props themselves. So, what I did for the *L'Epee* performance [*L'Abbe de L'Epee: A Satire,* performed at Elstad Auditorium at Gallaudet University, April 2011] was to raise the back of the stage. The wonderful thing was the Deaf audience's reaction: stunned, amazed. Amazed how simple a change can create a difference in the experience of theater patrons within Gallaudet University's Elstad Auditorium. Raising the back of the stage meant that the focal sight line was expanded to include a depth that heretofore had never been achieved.

"Hearing stage designs tend to be rigidly within a box set, which after a while becomes visually dulling and boring to the eyes—very dry and dead. The hearing

audience can accept that static design, because they're receiving stimulation via sounds. They're watching people moving around, voices being said here and there, music overlapping—so they can accept that static stage design. But for me sitting there, nothing is really moving—it's all static. Where's the visual stimulation for my eyes? The hearing audience has hearing stimulation, but where is my equivalent visual stimulation? That is what influences my stage designs in a variety of ways. My stage designs tend to have the ability to be fluid, to have a sense of motion on the stage. . . . I think every artist has clues in the past that link to his or her current life. There is always a link from the past to the present—a thread from the past that continues to influence your present life. If you understand that thread, then you understand your style. That's what I always try to emphasize to my theater students here at Gallaudet University. Deaf Gain ultimately means for an artist to be able to express the self artistically without needing to think consciously 'I AM DEAF' and specifically express that. That's too much pressure, and at the same time, each Deaf person has a different interpretation and definition of themselves. I would rather be recognized for creativity and my art rather than the fact that I am a Deaf person who happens to create art. . . . value assigned to which changes the outcome. Where does one set the value? Is it more important that I am an artist? Or is it more important that I am Deaf?"

CHRISTINE PARROTTE "Signs are three dimensions—or maybe even four dimensions. Anyway, signs are three dimensions with our facial expressions included in the language. It's impossible to put all that information within a written sentence. There are three areas: the signs, the facial cues, and the body motions in our language. All of these areas are working together in motion. For example, I watched a movie of a police robot. *(mimics the motion of police robot)* Now how do you write that? 'First you move this shoulder this way, then that way, the arms and hands moving in this direction and then that direction in a very stiff style.' . . . With signs, I quickly showed it visually—I embodied the robot—and I explained it all in four dimensions. That is the beauty of it. Can you explain it equally adeptly in written language? 'A robot moved stiffly.' When I read it, I do not see it. Or actually, I cannot picture it, as it is missing details. But when I show in signs exactly what it looks like, I do it quickly and effectively."

PATTI DURR "No more or less than any 'ways of being' shape and inform people. However, if we are speaking specifically of De'VIA works, then, yes indeed, being Deaf does give insights, perspectives, and advantages to the creative processes, just as being of other disenfranchised groups adds to visual testimonies and expressions. De'VIA stands for Deaf View/Image Art, a Deaf art movement founded in the late 1980s (for more information, go to http://www.deafart.org/index.html). With visual art, representation of sign language (due to its visual nature) can amplify the visual nature of the work of art in ways that perhaps written language,

spoken language, and/or symbols cannot. Furthermore, often the Deaf viewer gets a heightened sense of appreciation and pride in being able to see signs within visual art that the average nonsigner would not be aware of or would view as if abstract."

JON SAVAGE "I noticed my father (who is a filmmaker and photographer with many years of experience) has to attend to sound, visual/picture, and other stuff that spreads the quality of each aspect thin. Imagine a pie graphic: my father has a section for sound, a section for visual, a section for other aspects, while my pie graphic would be all visual and no sound. So my visual talents are much more deep and more attended to. My father has to think of all those various aspects, while I focus fully on the visual aspect. For example, my father and I watched a movie together. I am analyzing the visual aspect—what I like and what I don't. My father is looking at the visual but also listening to the sounds, so he uses half of visual aspect, while I have advantage of full visual attention.

"I am now trying to be more abstract in my art, with nothing specific toward my being Deaf. The power of my art can apply to anyone on earth. Altogether I have about fifteen art pieces that can apply to anyone, done from a Deaf eye's art. I am a Deaf artist. When my paintings' focus can apply to anyone, I think there's more to discuss that way. There's more to analyze the meaning of the art, and *then* have the viewers ask, 'Who did this art?' A Deaf guy. I want the content of my art to be important. I don't want a viewer to say, 'I cannot discuss this piece, as it is related to the Deaf.' I would rather have a discourse on my art, which just happened to be created by a Deaf artist."

MONIQUE HOLT "In the medium of acting, I recognize that since I am deaf, I have grasped more details of embodying characters and meaning in mannerism, behavior, and sending signals—also reading body language and facial expressions—compared to my other, non-Deaf actors. They pay attention to different details, which are mainly sound and vocal quality, mannerisms of speech. . . .

"A most enlightening question came to me when I worked on *Skin of Our Teeth,* produced by the Public Theater / Joseph Papp of New York City and directed by Irene Lewis. The play was performed in the New York Shakespeare Festival in Central Park. Irene cast me herself and wanted me to sign all of my lines. I was a member of the 'ensemble' (Muse Sister, Broadcast Sound Assistant, etc.). I had to translate my own lines, which happened to consist of statements from Socrates's philosophy. I admit I didn't understand my monologue. I went to see our dramaturge and asked him for his assistance. He was at a loss and admitted that he didn't understand it himself. So I asked my 'voice' (who was also a member of the ensemble) to see if she understood her monologue, which was Aristotle. She said bluntly that she didn't care what it meant. She just said the words. I was stunned. I couldn't get away with it like she did, because in the translating process I am

required to understand what something means before I am able to choose which signs to use for particular abstract concepts of what life is all about without concrete links to the real life. So I ended up asking my partner, who happened to be majoring in music, history, and philosophy. He saved me. I went back to the dramaturge and explained the monologue to him. He said, whoa, it made a lot of sense why the Muse Sisters say those lines in this play. I guess a lot of people didn't understand *The Skin of Our Teeth* because of this missing link. We cannot afford to leave important concepts out just because we don't understand them. I could simply have signed a word-for-word rendition of the monologue, but it wouldn't make any sense—just like seeing me signing gibberish. Yes, it meant more work for me as a Deaf actress, but it made me value my language even more. This experience made me want to create visual language that spectators can appreciate."

PETER COOK "When I was three years old, I became Deaf through spinal meningitis. So I had already been impacted by language—I had been speaking and hearing spoken language at the time. But that was all gone, I don't remember that period of time. Of course, I immediately started observing and learning from the visual world. I love watching and studying people's body language, since I had no language: I had forgotten the spoken language. As a result, I depended on gestures, body movements, facial expressions, and emotions that I perceived through my eyes *plus* the sensory tactile cues, such as the vibrations received: someone hitting the floor, a car passing by, or an explosion of some kind that I felt through my body. All that became my world that I absorbed via my eyes and body."

NANCY ROURKE "Being a Deaf artist, I have done artwork with nonsigning artists, and I have communicated with them about art. I have done the same with Deaf artists. Both are very different, and I believe the difference is in communication: where they are coming from and how they are being exposed to communication in general. Basically, it is how they look at art in their own imagination as well as visualization; it is their cognitive skills that are different. Deaf artists rely heavily on their eyes; therefore, their cognitive techniques are much more vivid. Their visual thinking goes deeper in many ways. They pick up details instantly and observe them intensely, which I know based on my own experience. It is very natural to me. This is something that nonsigning artists do not have, or have very little, and perhaps it is very rare. Nonsigning artists rely on their eyes, too, but not in the same way as Deaf artists. I also see that Deaf artists have more senses, or that their senses are much more elaborated, because Deaf artists use different parts of the brain in that process. They see and observe everything around them differently from other artists. These are the gains that I feel Deaf artists have that other artists do not have."

How do you feel that Deaf artists could contribute to the wider practice in your art field? For example, what could hearing artists learn from Deaf theater or Deaf filmmaking? Can you provide specific examples?

WAYNE BETTS JR. "During production of the film *Gallaudet,* we worked with a hearing crew. The director was Ryan Commerson, and I was the director of photography, but I didn't operate the camera—instead, a hearing cameraman who was skilled with the Steadicam worked alongside me. To tell him the vision and plan of the film, we started with an interpreter. The interpreter was working with the two of us, but it wasn't smooth communication. We kept going into circles in our communication. I'd explain to the interpreter what I wanted and used a word that she didn't know, and we had to backstep and explain the word. The hearing guy and I weren't connecting. Finally, I had the interpreter go away, and we started understanding each other's eyes and gestures. He gestured holding the camera in which direction, but mistakenly holding it upside down via his hand gesture. I corrected his gesture, showing with the camera right-side up, then showed him the position that I wanted him to move the camera around the character. He gave me thumbs up, and he rapidly started from that point on being able to pick up visual cues via hands/signs/gestures, in spite of his not knowing how to sign/gesture before. Gestures are visual, the same as movies being visual. His work as a cameraperson is 100 percent visual. No sound for the cameraperson, so a Deaf person working with him worked out perfectly with three dimensions viewpoint. So yes, we can contribute to hearing filmmakers if they all knew signs."

PATTI DURR "I think there is much to be explored in theater and Deaf cinema that has not yet been fully manifested or experimented with. We are, by and large, still stuck in 'imitation art' via adopting and employing techniques utilized in mainstream theater and filmmaking. Once we free ourselves more to create and push the limits of theater and filmmaking and *multi*media from a Deaf perspective and sensibility, we will see new art forms and expressions emerge. After all, ASL is pretty much multimedia in action.

"We have seen professional Hearing theaters experiment with light, shadows, puppetry, performance art, etc., but we haven't really seen much of that successfully done by Deaf theater groups. With Deaf cinema, I would say the most progressive exploration of ASL and film beyond the original NAD motion-picture project at the turn of the century would be *Vital Signs* [edited by Wayne Betts Jr.], a short-short film but a brilliant attempt at representing the cinemagraphic nature of ASL storytelling within the medium of film by layering it with action footage to complement and accentuate the story line."

ETHAN SINNOTT "The old adage 'You can lead a horse to water, but you can't force a horse to drink' is true for teaching hearing people. It is never too late to

learn; the question is, Do they want to learn? Are they open enough to allow themselves to learn? That's the big question. That's the question that needs to be asked. . . .

"Being an artist means you have to build on the gift you were given. You're given those gifts. What do you do with them? What do you want to say with those gifts? That's the difference between having talent and being an artist. . . . At the same time, it all depends on whom I am working with, whether the hearing director is receptive. If my client, the director, wants all props to stay in one place, then I do what my client wants while still making suggestions. Maybe the goal isn't to be static: why not make the theater experience more complete in terms of visual and auditory experience? Why not have a 'total or complete' experience rather than a partial experience? Of course, this all depends on the interpretation of experience.

"Anyways, I work with the director, who, if open *(signs* OPEN *in front of torso, meaning sensory openness)* and receptive to the idea, then you can see the results within the stage design. You will see props and pieces on the stage moving. I like moving pieces, and I like stage designs that look deceptively simple. When they first see my stage designs, people may be thinking, 'That's all?' but when the pieces are moved, the audience is moved. It is true what they say in the theater field: 'Stages that look simple are often more difficult to accomplish.' "

LOUISE STERN "I don't feel that Deaf artists necessarily have any more to teach hearing artists. As with any creative discipline, it is the strength and truth of the work that is valuable. Deaf artists have an experience, a perspective, and a visceraliy that is not as mainstream as many and that ties in with much of the important writing and art of our age, but that is no guarantee that their work will jump out to other artists. An assumption that it should can weaken Deaf art."

PETER COOK "We all have different ways to repeat things, just like they do. So I helped them see rather than in two dimensions to three dimensions. Oh now they 'see.' It doesn't matter what language is being used, but what is important is how you 'deliver/present' the language. The use of classifiers in sign language has parallels with some gestures. For example, interval classifiers have some parallel to iconic gestures that hearing people use. The only difference is that we can use classifiers to show changes within. When people modulate their voices to show changes, in the same idea, we can show changes within our classifiers, such as this story/poem: butterfly morphs into a cocoon, out of which pops up a dragonlike creature who then walks away. [Editor's note: Only one sign was used, BUTTERFLY; everything else was done seamlessly via classifiers.] I am using transformation techniques of which signs and classifiers give opportunity to use. It's really cool, and they can see that. That's what is different, that is our uniqueness. They see and it makes them see differently. They learn something."

MONIQUE HOLT "For example, Christine Sun Kim (CK), a young Deaf Korean woman, 'installation artist': she studied sound and music at SUNY–Stonybrook for her MFA. The department chair was stunned and didn't know what to do with her. My colleague Larry Polansky, a professor of electronic music at Dartmouth College, was hired to come to SUNY and assist the professors to work with her. She really blew their minds and those of her peers. After Larry's experience, he invited her to Dartmouth to give a lecture to his graduate music students. CK is not like Evelyn Glennie, who is surrounded by musician family members and auditorially/sensorially trained to play music. CK is profoundly deaf, and her perception, her concept of sound and music are entirely different from other, non-Deaf people. CK made people realize there is more to a Deaf person's sensory experience of sound and music. [See http://www.christinesunkim.com/.]

"Another example would be Leon Lim, a young Deaf Malaysian man, 'visual artist,' who studied art at RIT [Rochester Institute of Technology]. His work is what art critics call a true expression of an artist. They don't see his deafness, but they saw his artfulness. He was selected to be on Bravo's *Work of Art: The Next Great Artist* TV show."

JONATHAN KOVACS "Teaching a hearing person to become visually fluent like Deaf people would be extremely difficult. I think each group has its own skills . . . like blind people are extremely talented in hearing sounds. Can they teach sighted people to hear as acutely as they do? That would be very hard. In the same way, it would very difficult for hearing people to see as acutely like us. Deaf people have their own 'gain.' "

MICHELLE MCAULIFFE "One of my pieces, *First Crush*, shows one type of miscommunication. In this piece I interviewed friends and strangers with a video camera. I asked each individual to tell me about their first crush; those who knew of my deafness were instructed to talk as if they were not aware of it. Throughout the editing processes, what was a sweet, giggly story about someone's first crush turned into a private hell for me as I agonizingly tried to lip-read what was being said word for word. It was painfully tiring for my eyes as well my brain to try to make out all of the words—what I thought was being said—and I faced uncertainty with what was being said, depending on both the person and environment. I tried not to give myself too many chances to figure out what was being said, because I wanted to stay true to what happens in conversations in my environment. I added subtitles to the video when I understood (or at least when I thought I understood) the words. When I could not understand what was being said, I muted the sound, signifying the loss and separation I feel when I am not getting information from the other party. This presentation allows the viewer to grasp, even to a small degree, what I experience on a daily basis. What began as a simple, lighthearted question turned into a frustrating breakdown in communication. In this work, the audience will

viscerally experience something as they try to understand the content of this video. I wanted the experience to be pure, so the environment for the interviews was very important. I wanted each interview to occur in a place where I regularly encounter people and try to communicate: in bars, at school, in my studio, on the street, in a friend's home, at my home, and so on. The physical location was varied as well as the environmental factors. As in my reality, sometimes the lighting or the background noise in a space has a serious impact on how much information I can gather from a conversation. Some of the interviews happened in an excellent environment for lipreading, a safe zone, so to speak. (There is actually a term used by the deaf community for ideal communication situations for lipreading: 'deaf friendly.') Other interviews take place in a dark bar with loud music playing in the background or some other environmental communication barrier.

"Two additional experiences from making *First Crush* involved me as a deaf artist interacting with the hearing world and the audio material. When I first approached my professor with this piece, I had lip-read it and felt like I pretty much understood the gist of each story. This meeting was interpreted, and while the video was playing I watched the interpreter relaying the information from the video. I was shocked. I found out I had no idea what information I had missed and that I really had not understood nearly as much as I thought I had. This was a real awakening for me—to experience so strongly exactly what I wanted the audience to experience.

"Bottom line: I feel that everyone could benefit so much from each other if they work together. The world would be in a much better place."

CAMILLE JETER-LORELLO "Hearing actors benefit from deaf actors? Yes, I agree. In my fifteen years at National Theatre of the Deaf, we would have hearing actors under contract for two years. NTD does not look for interpreters for the theater. We hired professional actors for their ability to control their voices. They come in and are shocked to see fifteen Deaf actors. We'd have two hearing actors who did not know any signs whatsoever. They lived, slept, ate, breathed with us 24/7 for two years. And today, most of those hearing actors who are ex-NTD voice actors are top interpreters. They really were fascinated by body and facial expressions all being congruent and in sync. They learned without going through an ITP (Interpreter Training Program), they learned from us during our trips on the bus, on the plane to different countries, and within America. They benefited from this. I encourage more people to learn like that."

CHRISTINE PARROTTE "Yes, with the Adobe After Effects [film-editing] class at the Corcoran [Washington, D.C.], I made a square that started moving, and it disappeared into the soil, then becomes a tree that sprouted square leaves. This was all in preparation for our final project. Again, visually, it was clearly understood. My classmates understood. Yeah. They understood. . . . Some classmates' projects

were full of square-making motions, but it was not clear what the squares or their motions represented. It was much more abstract. I noticed the teacher asked a lot of questions to those classmates, trying to understand what their art represented. With mine, they asked me only one or two questions, because it was visually clear and easily understood.

"One person used the concept of magnets, but some of the other classmates didn't understand it. The concept had one square, and then another square came near it. The first square zoomed away in the opposite direction, as in north and south, polarized opposites. Some classmates thought the first square didn't want the second square and ran away. No, that art was hard to explain. At the final presentation, the artist added sound to the magnets. The other classmates finally understood. Without sound, they couldn't understand it. Hearing people think differently; they process things differently. When sound was combined with the picture, then they understood the squares to be magnets. My project didn't have any sound, and yet they understood my story. A sperm going into soil grows a tree that withers away, and then again the sperm came to make another tree. 'Life.' It repeats over and over, just like life.

"Yes, hearing people are often poor at moving or motions. If a hearing person does a framed art, I can understand it most of the time. Some are abstract. But with this After Effects class that focused on motion, it was completely different for them, as they had to have sound to understand the projects. It was very interesting."

JON SAVAGE "For example, my father worked for years in photography and filmmaking. I grew up watching him. When I started to explore filmmaking and making movies, I would discuss with my father filmmaking techniques. Because he had been in the field for so long, I assumed he was much more advanced in filmmaking techniques than I was. That wasn't the case, because in a specific area, I am much more advanced than he is: such as in the area of color. I see some of his film with dull colors and asked him, 'Why not make it more vivid?' In a wide-shot scene with a lot of people walking around, I suggested, why not put stronger colors around the key character to draw the audience's eyes to that character? His answer was, 'I never thought of that.' The reason is he was so busy balancing the sounds and the pictures within the film and figuring how to make the audience follow the key character in the film.

"So when he said, 'I never thought of that,' I look at him askance as he's doing this for some thirty years and I just started six years ago. I have learned new techniques while he's doing the same techniques for all these years. I make a bunch of suggestions on how to do filmmaking to take it farther. He's amazed, as he never thought of it.

"Another example: Deaf and hearing surfers of equal skills have the same ability, but I can give more descriptions on motions. Hearing people can say, 'You do

this, and then you do that,' when teaching surfing skills. But I have the ability to explain it in depth visually. I did some Deaf interpreting, as I understand the formula to surfing. During the surfing class, the teacher was explaining using a vocabulary of words. The words didn't mean anything in and of themselves. When I gave signs to the words, the teacher exclaimed, 'That's what I meant!' So I started to feel more confident, but then the surfing teacher asked me how I would sign this or that. He kept saying, 'That sign makes sense!' and he thought it was really cool. I think his teaching skill will have increased with his new knowledge of body language, sign language, and movement."

Artist Biographies

WAYNE BETTS JR. is co-owner of Convo (ConvoRelay.com) and cofounder of Mösdeux. He filmed and edited *Through Your Child's Eyes: American Sign Language* and created a short ASL poetry film, *Vital Signs,* which was showcased on PBS's *History through Deaf Eyes.* He has been a speaker at TEDxIslay on "Deaf lens." More information may be found at http://waynebettsjr.com/.

PETER COOK is an internationally reputed Deaf performing artist whose works incorporate American Sign Language, pantomime, storytelling, acting, and movement. He performs in the Flying Words Project with Kenny Lerner. He lives in Chicago and is associate professor in the ASL–English interpretation department at Columbia College. More information may be found at http://www.deafpetercook.com/home/Flying_Words_Project.html.

PATTI DURR is a partner, parent, and professor from Rochester, New York. She is involved in Deaf cultural studies with a focus on De'VIA, Deaf cinema, Deaf theater, and Deaf history. More information may be found at http://www.rit.edu/ntid/deaftheatre/ and http://handeyes.wordpress.com/.

MONIQUE HOLT is a literature artist who translates written words into Artistic Sign Language performance based on American Sign Language.

CAMILLE JETER-LORELLO has been involved with the National Theatre of the Deaf and taught ASL literacy at the New Jersey School for the Deaf. She has conducted national workshops in theater arts, interpreting, ASL, and storytelling techniques.

JONATHAN KOVACS was a child actor in *Little House on the Prairie, The Six of Us,* and *The Family Tree,* as well as other performances.

MICHELLE MCAULIFFE was born and raised in the San Francisco Bay area and received her MFA in photography from George Washington University. She pre-

sented her work and processes at a TEDx conference in Austin, Texas. She is a professor of art at Gallaudet University.

CHRISTINE PARROTTE holds several BA degrees in the art field and is currently teaching art at the Model Secondary School for the Deaf in Washington, D.C. Her areas of creativity include photography, filmmaking, drawing, painting, building stage props, and poetry.

NANCY ROURKE is a painter. Her art is strong in primary colors and focuses on audism, Deaf history, politics, cultural linguistics, and the second wave of oralism. Her themes are resistance, affirmation, and liberation. More information may be found at http://www.nancyrourke.com/.

JON SAVAGE is a pop-artist painter, video editor, actor, and cinematographer. He is devoted to educating people about the linguistic, social, political, and cultural issues of the deaf community. Growing up with a photographer-videographer father and craft-artist mother, he has been exposed to the arts for as long as he can remember. More information may be found at http://jonsavagegallery.com.

ETHAN SINNOTT is a director, scenic designer, translator, and arts advocate. He received his BFA in fine arts from the Rochester Institute of Technology and his MFA in theater scene design from Boston University. He is associate professor in Gallaudet University's theater and dance program and is professionally active in theater in Washington, D.C.

LOUISE STERN grew up in Fremont, California, the fourth-generation deaf in her family. Her art, based on ideas of communication and language, has been exhibited in Geneva; London; Port Eliot, Cornwall; and New York City. She is the author of a book of short stories, *Chattering*, and has published a contemporary art magazine for children.

AFTERWORD

Implications of Deaf Gain

Linguistic Human Rights for Deaf Citizens

TOVE SKUTNABB-KANGAS

Reading this revolutionary book packed with new information that will change many people's lives and ways of thinking has been a major and wonderful learning and reflecting experience, as I am sure it will be for thousands of others. Most of us hearing people have been used to reading mainly about problematic aspects of being deaf and the struggles Deaf people have waged trying to get a voice and trying to get at least some basic rights. Then came articles and books in which Deaf people were/are consciously trying to "find themselves," demanding the right to define themselves and their needs, including in education, rather than being defined from the outside. Deaf people were "discovering" Deafhood and Deaf culture and starting to name them and were getting rid of "handicap" and "victim" ideologies while at the same time using some of the few benefits that defining themselves *also* as a "disabled" group may give. But this forward-looking book is the first one that has collected and consistently stayed with the positive gains that Deafness, sign languages, d/Deaf people, and Deaf culture represent: *not* "loss" (except in relation to those societal political issues which cause hearing people to believe and act in audistic ways) but *gain*—and gain not only for Deaf people themselves but for the whole of humanity.[1]

In keeping with the gain for humanity is also the paradigm shift toward a position that is not routinely talking about the value of "difference" and "diversity." Such talk can be done in vague, almost wishy-washy, non-duty-inducing terms found in many prefaces of declarations, recommendations, charters, conventions, and covenants. Some of us often call this UNESCO-ese. In the paradigm shift that this book advocates, "normalcy" is questioned in much more intriguing and more theoretically *and* empirically grounded ways than in most philosophical and cultural writings. Likewise, some of the consequences of this questioning for all of us, deaf or hearing, are spelled out, and more are hinted at. The incredibly thorough and concise theoretical foundations, the solid empirical evidence, and the really broad multi- and transdisciplinarity make the book unique. I don't think I have learned so much from one single book for many years, if ever.

Situating Myself as the Learner

I felt humble and honored when asked to write an afterword about an area where I have been a frequent but pretty ignorant visitor for decades. First, a few words about that. My first professional contact with Deaf people and sign language (in this case Swedish Sign Language) was when Inger Ahlgren asked me to come and talk to parents of deaf children about bilingualism.[2] Some of the parents were d/Deaf themselves, and there was interpretation between spoken Swedish (one of my two mother tongues; the other one is Finnish) and Swedish Sign Language. The discussions before, during, and after the talk were a real eye-opener. This experience started my frequent contact with many Deaf people, groups, researchers, and organizations in several countries, from Japan and India to Canada and the United States, from Australia and South Africa to the Nordic countries. Without them (and some signing but hearing friends), I would know nothing about deafness and, especially, Deafness. They have shown endless patience and tolerance, decade after decade, in teaching this ignorant person and gently correcting my many mistakes, prejudices, and outright stupidities. Heartfelt thanks!

One summer, I decided to use double earplugs for a week or two, to get at least an inkling of what it feels like to be Deaf and of how I would cope with other people at home, in shops, in banks, and so on. As it happened, I did not need to resort to earplugs: suddenly I lost my hearing completely for a few days and had exactly the experience I had wanted; later much of it came back. But now I myself am hard of hearing and have used a hearing aid for almost five years. Being hard of hearing has caused endless frustrations for me and my husband and, to a lesser extent, for other family and friends. But it has taught me a lot. It has also given me an opportunity to speak up. Many hard-of-hearing people say that they have wanted to say what I say but they have not dared to do it; they don't dare to be as demanding as I am. Being an old professional woman not afraid of speaking up, and not easily embarrassed, I raise the issue at the beginning of every meeting and conference that I attend. I tell hearing people how they should speak if they want to make life easier for hard-of-hearing and even Deaf people. When I give a presentation at a conference (and this happens often), it is obviously also in my audience's interest to speak in such a way that I understand their questions and comments. I have seen how difficult it is, even for very close friends who really want and are trying hard to change; they often forget in a minute or two. They mumble, look in other directions, hold their hands in front of their mouths, don't speak up, expect me to hear when they have their backs toward me—but I keep reminding them. All this is extremely well known to Deaf people, whereas most hearing people are completely unaware of these simple issues.

Now back to some topics that this rich book has made me reflect on. Since you, the reader, have read the chapters and Dirksen and Joseph's excellent and reflective Introduction, there seems to be little left for me to say. Therefore, I will

discuss a few of the issues that I have worked with but that the book does not cover.[3] I will try to relate them to the Deaf experience, to sign languages, and, to some extent, to this book and its unique message.

Deaf People (and Other Signers) as Front-Runners

The Deaf people and their organizations, especially the World Federation of the Deaf (with Yerker Andersson but especially Liisa Kauppinen and Markku Jokinen as presidents), were among the first minority organizations in the world to start talking seriously about and demanding linguistic human rights, long before other linguistic minorities used the concept.[4] Paddy Ladd, in addition to writing his pathbreaking studies on Deafhood and Deaf culture,[5] has also pointed out to me that a British Deaf organization recognized very early the noneducation of Deaf children as a form of "linguistic and cultural genocide," schools having succeeded, in a few years, in submersion programs to make perfectly normal children into "intellectual cabbages."[6] Likewise, both Deaf people and many hearing signing people have made massive efforts to try to inform (other) hearing people about sign languages, about the hegemony of spoken languages and hearing people, and about strategies used in constructing Deaf people as disabled and unable to decide for themselves who they are and what they need. Jan Branson and Don Miller, for instance, gave a workshop at the 11th World Congress of Applied Linguistics in Jyväskylä, Finland, in 1996 called "What Every Applied Linguist Ought to Know about Sign Languages." It was an eye-opener for many.[7]

Linguicism and Audism

In order to be able to demand linguistic human rights (hereafter LHRs) and to plan for the positive measures that the new insights in this book must lead to, an analysis of the past and, unfortunately, the present situation for most Deaf people in the world is necessary. I have named some of the issues in terms that may be provocative, but many indigenous, tribal, minority, and minoritized (hereafter ITM) people recognize their own experience in them. In May 2013, I spoke to a seminar of South Saami in Norway (an indigenous people in two countries numbering, maximally, around a thousand people). Those who had not heard or read me earlier said it was the first time in their lives they had heard somebody call a spade a spade—and, after a shock, they were delighted to recognize the concepts that they thought really described their own lifelong experience and that of their often forcibly assimilated ancestors. It gave them self-confidence and encouraged their agency, they said.

In my view, audism is a type of linguicism.[8] My old definition of *linguicism* was "ideologies, structures and practices which are used to legitimate, effectuate, regulate and reproduce an unequal division of power and resources (both material and immaterial) between groups which are defined on the basis of language."[9] In the case of sign languages, we are talking about hierarchization, reproduction

of unequal power relationships between spoken languages and signed languages, and between people who use these two. Among people who use spoken languages and those who use signed languages, we can also distinguish subcategories. Those who (regardless of whether they are hearing or deaf) belong to a dominant population ethnically, socially, economically, in terms of level of formal education, gender, age, and so on have more power and resources than those who belong to dominated populations. Some of these distinctions have their own names for the "-isms" that discrimination on the basis of them represents: racism, ethnicism, classism, sexism, ageism. Linguicism and thus also audism are related concepts.[10] In many cases, and certainly most cases if we think of Deaf people worldwide, Deaf people are situated in the economically, socially, and politically lowest and worst-off parts of the population. Linguicism, specifically linguicism/audism in education, has effectively promoted Deaf people's material and often also immaterial poverty, also through curtailing their capabilities in the noneducation they have received, provided they have attended school at all.

Killer Languages

We also have to discuss "killer languages" (originally Anne Pakir's term from Singapore) in relation to linguicism and audism. When "big," dominant languages are learned subtractively (at the cost of mother tongues) rather than additively (in addition to mother tongues), they can become killer languages. "Being" a killer language is not a characteristic of a language. It is a question of how a language functions in relation to other languages. Any language can become a killer language in relation to some other language. Besides, "languages" do not kill each other. It is the power relations between the *speakers* of the languages that are the decisive factors behind the unequal relations between the languages, which then cause people from dominated groups to learn other languages subtractively, at the cost of their own. Killer languages pose serious threats toward the linguistic diversity of the world. This linguistic and cultural diversity, which is related both correlationally and causally to biodiversity,[11] is one of the issues discussed in the Introduction of this book. There will be much more to say about it in the future.

English is today the world's most important killer language, but most dominant languages function as killer languages vis-à-vis smaller or less powerful languages. There is a nested hierarchy of languages and glottophagy ("language cannibalism"). When speakers shift to another language and their own language disappears, the incoming new language thus functions as a killer language. English may in some domains be a killer language even in relation to Danish, Finnish, and other "big" Nordic languages. ("Big" here means that they are among the 150 languages with the largest number of speakers, of the world's almost 7,000 languages.)[12]

All oral languages can, through enforced oralism, function as killer languages in relation to sign languages. Official/national oral languages may be especially

important killer languages vis-à-vis sign languages. American Sign Language may pose serious threats to all other sign languages if it is learned subtractively. Indeed, it may be the worst killer language among sign languages. Thus, it is really important that it is learned additively.

Do Languages Disappear "Naturally"? Submersion Education

Many people think that languages that disappear, among them many small sign languages, do it "naturally"; they are deemed useless by their users, who shift for instrumental reasons and because they (are made to) believe that it is useful for them to shift. Technical devices such as cochlear implants may make all signed languages "unnecessary" within a few decades, some claim. But languages do *not* just disappear naturally. Languages do *not* "commit suicide." In most cases, speakers/signers do *not* leave them voluntarily for instrumental reasons and for their own good. Languages are "killed off." Most disappearing languages, including sign languages, are victims of linguistic genocide. One reason why we desperately need LHRs in education and elsewhere, and why maintenance of all the world's languages is so vital, in addition to the reasons enumerated in the Introduction, is that LHRs can counteract linguistic genocide, especially in education.

Today, almost all indigenous/tribal children, many linguistic-minority children, and children from other dominated minoritized groups are taught subtractively in submersion programs, through the medium of a dominant language that replaces their mother tongue. They learn the dominant language at the cost of the mother tongue. Very few of them are taught additively, in mother-tongue-based multilingual programs with good teaching of the dominant language as a second language and other languages taught as foreign languages. This approach can make them high-level bilingual or multilingual. There are deaf children in all these groups (for example, Deaf Native Americans, Deaf children in Africa from dominated groups). And all Deaf people belong to a linguistic minority. Most Deaf children in the world are taught subtractively. Subtractive teaching replaces mother tongues, kills languages, and works for linguistic and other homogenization instead of supporting diversity. It prevents profound literacy. It prevents students from gaining the knowledge and skills that would correspond to their innate capacities and would be needed for socioeconomic mobility and democratic participation.

According to Nobel Prize laureate Amartya Sen, poverty is not only about economic conditions and growth; the expansion of human capabilities is a more basic locus of poverty and a more basic objective of development.[13] Dominant-language education for ITM children, including Deaf children, often curtails the development of the children's capabilities.[14] Thus, it perpetuates poverty. Teaching ITM children through the medium of an alien dominant language can, and in many cases does, lead to negative results in linguistic and cognitive competence, school achievement, self-confidence and identity development, and, later, access to the

labor market and possibilities of democratic participation. Thus, it may cause serious mental (and even physical) harm. It transfers or tries to transfer children to another linguistic group through enforced language shift. It also prevents access to education, a human right that is granted in several human rights instruments.[15] Thus, it can be genocidal, according to the UN Genocide Convention's definitions of genocide.

Linguistic Genocide and Crimes against Humanity

When people hear the term *genocide,* most of them react negatively and completely emotionally and ask, Is the term not too strong? How can one use it about something that does not involve physical killing of groups? We have to define the term in order for people to decide whether the claim about genocidal education is true. The United Nations International Convention on the Prevention and Punishment of the Crime of Genocide has five definitions of genocide.[16] Only one of them is directly about physical killing, and two may indirectly lead to physical killing. But the remaining two fit today's ITM education:

Article II(e): forcibly transferring children of the group to another group

Article II(b): causing serious bodily or mental harm to members of the group

My claim is that oralism in Deaf education is genocidal according to these United Nations definitions of genocide. For oral-minority students, education through the medium of a dominant-majority language leads to the students' using the dominant language with their own children later on. Over a generation or two, the children are linguistically (and often in other ways) forcibly transferred to a dominant group; they are linguistically and culturally assimilated. Because there are no alternatives in formal education, namely schools or classes that are taught mainly through the medium of the threatened indigenous/tribal or minority languages, the transfer to the dominant-language-speaking group happens by force; it is not voluntary. For it to be voluntary, alternatives should exist, and parents would need to have reliable information about the long-term consequences of the various choices. This would also include information about the serious limitations of cochlear implants in situations where the advice from medical doctors and other health personnel is that Deaf children should not be encouraged to learn a sign language (this advice is official in Denmark today). None of these conditions is usually fulfilled for ITM parents and children; thus, situations where children lose their first language can often be characterized as genocide.

Given that most Deaf children are born to hearing parents, their situation differs here from hearing children. Parents and children do not have the same mother tongue, and many Deaf children are, in their turn, going to have hearing children. In Table A.1, I have compared the forcible transfer that happens in education for two groups: oral indigenous or minority children who are taught through the

TABLE A.1 DIFFERENCES IN FORCIBLE TRANSFER IN EDUCATION BETWEEN TWO GROUPS OF CHILDREN

Characteristic of Group	Forcible Transfer	Results (without massive efforts outside formal education)
Oral indigenous or minority children in dominant/majority-language-medium submersion programs that exclude the minority languages	From the child's mother tongue by *origin* (parents' mother tongue) to a dominant/majority (oral and written) language that is *not* the parents' mother tongue	Forced assimilation, risk of negative consequences for linguistic competence, school achievement, identity development
Deaf minority children born to hearing parents in oralism-oriented dominant/majority-language-medium submersion programs that exclude sign language	From the child's only possible mother tongue by *competence* (the language the child knows best, the only language in which a Deaf child can fully express himself or herself) to a dominant/majority (oral and written) language that *is* the parents' mother tongue	Forced assimilation, grave risks in cognitive and linguistic development, school achievement, identity development

medium of a dominant or majority language; and Deaf children of hearing parents who are taught through oral methods, such as speechreading (earlier called lip-reading) and speaking in a dominant-majority language to the exclusion of a sign language.[17] This is the predominant method in oralism, which is still a dominant feature in the teaching of Deaf children in many, if not most, countries.

There is a wealth of research and statistics about the "mental harm" that forced assimilation causes in education and otherwise.[18] As most Deaf people would be prepared to witness, assimilationist submersion education where Deaf students are taught orally only and where sign languages have no place in the curriculum often causes mental harm, including serious prevention or delay of cognitive growth. Is this genocide? Yes, because

- both groups, oral and Deaf minority children, are forcibly transferred to another language group (Article II[e]); and
- the subtractive education may cause serious *mental* harm to the children (Article II[b]).

For Deaf children, the harm caused is still much greater than for oral children. Why? Trying to force Deaf children to become oral only, to the exclusion of sign languages, and preventing them from fully developing a sign language in formal education deprives them of the chance of learning through this education the only type of language through which they can fully express themselves. Because they do not share this mother tongue with their parents, they are completely dependent on formal education (in addition to peer groups, where they learn everyday language) to develop it to the highest possible level.

In work cowritten by Robert Dunbar and me, we conclude that when states persist in subtractive educational policies (as most states today do), implemented in the full knowledge of their devastating effects on ITM children, this can, *from an educational, linguistic, psychological, and sociological point of view,* be described as a form of linguistic and cultural genocide.[19] However, to claim also in legal terms that this education is genocide, more court cases are needed in order to ascertain the precise interpretations of some concepts, such as "intent," in the Genocide Convention's definitions.

But there are several recent examples already where lawyers have concluded that the "intent" need not be expressed directly and openly. No state declares, "We intend to harm children." Instead, harm can be deduced from the results; that is, if a state organizes educational structures that are known to lead to negative results, this can be seen as "intent" in the sense of Article 2. Julie Ringelheim, for instance, discusses a landmark judgment where the European Court of Human Rights "makes clear that no intention to discriminate is required for the discrimination to exist: the sole fact that a measure has a disparate impact on a minority is sufficient to establish the existence of differential treatment—whatever the intent behind the policy. This opens the possibility of addressing structural or systemic forms of discrimination."[20] Given that all forms of genocide can be seen as crimes against humanity, and oralism in formal education can be an instance of linguistic genocide, oralism in the formal education of Deaf children can also be seen as a crime against humanity, with a criminal responsibility. The most complete description of what constitute "crimes against humanity" is now set out in the Rome Statute of the International Criminal Court of July 17, 1998. Article 7, paragraph 1, of the ICC Statute defines "crime against humanity."[21] Two acts enumerated in its subparagraphs (g) and (k) are relevant here.[22] In our view, it is possible to see the beginnings of an argument that certain forms of submersion education may, in some circumstances, constitute crimes against humanity.

Go to Court!

Thus, most education systems worldwide for indigenous/tribal peoples and minorities, including Deaf children, reflect linguicism, violate children's right to education, and may represent (linguistic and cultural) genocide and crimes against

humanity. This is an issue that Deaf organizations should try in court. Doing so would be yet another way in which Deaf people could be front-runners. Court decisions about all this might, in time, make it possible for more ITM children and their parents and organizations to start changing those state-controlled processes that have led to the suffering of many generations of ITM children. At the same time, claims for compensation for mother-tongue loss should be raised in courts. Court cases about compensation (such as the Australian case)[23] could be raised not only on grounds of loss of mother tongue and culture (as some First Nations people have done in Canada, partially successfully) but also based on genocide and crimes against humanity. This action could clarify concepts in international human rights law for the benefit of not only Deaf people but also other ITMs. At the same time, it might also start putting issues of normalcy into terms that could be used also legally, not "only" philosophically.

Notes

1. I will use the capital *D* from now on as a general term, except when *d* is warranted.
2. See one of the results of this talk: Tove Skutnabb-Kangas, "Om tvåspråkighet" [On Bilingualism], in *Språket och skolan* [Language and School], ed. Inger Ahlgren (Lund, Sweden: Liber, 1975), 31–37.
3. See my home page, http://www.Tove-Skutnabb-Kangas.org/, for some of the publications that I draw on here.
4. See Tove Skutnabb-Kangas, "Deklaration om barns mänskliga språkliga rättigheter" [Declaration on Children's Linguistic Human Rights], *Tiedote* (Stockholm) 8 (1984): 4–5.
5. Paddy Ladd, *Understanding Deaf Culture: In Search of Deafhood* (Clevedon, UK: Multilingual Matters, 2003); Paddy Ladd, "Colonialism and Resistance: A Brief History of Deafhood," in *Open Your Eyes: Deaf Studies Talking,* ed. H-Dirksen L. Bauman (Minneapolis: University of Minnesota Press, 2008), 42–59.
6. Ladd, *Understanding Deaf Culture.*
7. See also Jan Branson and Don Miller, "Beyond Integration Policy: The Deconstruction of Disability," in *Integration: Myth or Reality?* ed. Len Barton (Brighton, UK: Falmer Press, 1989), 144–67; Jan Branson and Don Miller, "Sign Language, the Deaf, and the Epistemic Violence of Mainstreaming," *Language and Education* 7, no. 1 (1993): 21–41; Jan Branson and Don Miller, "Maintaining, Developing, and Sharing the Knowledge and Potential Embedded in All Our Languages and Cultures: On Linguists as Agents of Epistemic Violence," in *Rights to Language: Equity, Power, and Education; Celebrating the Sixtieth Birthday of Tove Skutnabb-Kangas,* ed. Robert Phillipson (Mahwah, N.J.: Erlbaum, 2000), 28–32; Jan Branson and Don Miller, *Damned for Their Difference: The Cultural Construction of Deaf People as Disabled* (Washington, D.C.: Gallaudet University Press, 2002).
8. For references to audism, see H-Dirksen L. Bauman, "Audism: Exploring the Metaphysics of Oppression," *Journal of Deaf Studies and Deaf Education* 9, no. 2 (2004): 239–46, http://jdsde.oxfordjournals.org/cgi/content/abstract/9/2/239; and Bauman, *Open Your Eyes.*
9. Tove Skutnabb-Kangas, "Multilingualism and the Education of Minority Children," in *Minority Education: From Shame to Struggle,* ed. Tove Skutnabb-Kangas and Jim Cummins (Clevedon, UK: Multilingual Matters, 1988), 13.
10. The only area where we do not have a label is discrimination on the basis of the amount of formal education that people have; *classism* does not cover all of it. Many Deaf people who have been fortunate enough to be able to be in contact with other signing Deaf people

can be/are well educated despite never having attended school. School knowledge is just one type of knowledge, and formal education is just one form of education. Shall we call it "educationism"?

11. See the Web site Terralingua, at http://www.Terralingua.org/.
12. See *Ethnologue: Languages of the World,* at http://www.ethnologue.org/.
13. Amartya Sen, *Commodities and Capabilities* (Amsterdam: North-Holland, 1985).
14. Girishwar Misra and Ajit K. Mohanty, "Consequences of Poverty and Disadvantage: A Review of Indian Studies," in *Psychology of Poverty and Disadvantage,* ed. Girishwar Misra and Ajit K. Mohanty (New Delhi: Concept, 2000), 121–48; Girishwar Misra and Ajit K. Mohanty, "Poverty and Disadvantage: Issues in Retrospect," in Misra and Mohanty, *Psychology of Poverty and Disadvantage,* 261–84; Ajit K. Mohanty, "Perpetuating Inequality: The Disadvantage of Language, Minority Mother Tongues, and Related Issues," in Misra and Mohanty, *Psychology of Poverty and Disadvantage,* 104–17; Ajit Mohanty and Tove Skutnabb-Kangas, "MLE as an Economic Equaliser in India and Nepal: Mother Tongue Based Multilingual Education Fights Poverty through Capability Development and Identity Support," in *The Interrelation between the Right to Identity of Minorities and Their Socio-economic Participation: Studies in International Minority and Group Rights,* ed. Kristin Henrard (Leiden, Neth.: Brill / Martinus Nijhoff, 2013), 2:159–87.
15. There are many examples of this in Tove Skutnabb-Kangas and Robert Dunbar, "Indigenous Children's Education as Linguistic Genocide and a Crime against Humanity? A Global View," *Gáldu Čála: Journal of Indigenous Peoples' Rights,* no. 1 (2010), published by Gáldu: Resource Centre for the Rights of Indigenous Peoples, http://www.galdu.org/; available as an e-book at http://www.e-pages.dk/grusweb/55/.
16. United Nations, International Convention on the Prevention and Punishment of the Crime of Genocide (1948), 78 U.N.T.S. 277, available through the University of Minnesota Human Rights Library, at http://www1.umn.edu/humanrts/instree/x1cppcg.htm.
17. This table is taken from Tove Skutnabb-Kangas, "Linguistic Genocide and the Deaf" (2003), available through Deafzone, at http://www.deafzone.ch/file/file_pool/action/download/file_id/1379/.
18. See Skutnabb-Kangas, "Deklaration om barns mänskliga språkliga rättigheter"; and Tove Skutnabb-Kangas, *Linguistic Genocide in Education, or Worldwide Diversity and Human Rights?* (Mahwah, N.J.: Erlbaum, 2000). See also my coedited books from 2006 onward.
19. Lars Anders-Baer, in cooperation with Ole Henrik-Magga, Robert Dunbar, and Tove Skutnabb-Kangas, "Forms of Education of Indigenous Children as Crimes against Humanity?" (expert paper submitted at the United Nations Permanent Forum on Indigenous Issues, 7th session, April 21–May 2, 2008, New York); Skutnabb-Kangas and Dunbar, "Indigenous Children's Education as Linguistic Genocide and a Crime against Humanity?"
20. Julie Ringelheim, "Between Identity Transmission and Equal Opportunities: The Multiple Dimensions of Minorities' Right to Education," in Henrard, *The Interrelation between the Right to Identity of Minorities and Their Socio-economic Participation: Studies in International Minority and Group Rights,* 104–5.
21. Rome Statute of the International Criminal Court of July 17, 1998, available through the United Nations, at http://www.un.org/law/icc/.
22. See Antonio Cassese, *International Criminal Law* (Oxford: Oxford University Press, 2003); and Antonio Cassese, *International Criminal Law,* 2nd ed. (Oxford: Oxford University Press, 2008), on the International Criminal Court. See Skutnabb-Kangas and Dunbar, "Indigenous Children's Education as Linguistic Genocide and a Crime against Humanity?," for a detailed discussion on the application of these acts to submersion education.
23. "The Federal Court of Australia has found that the Queensland government discriminated against a 12-year old boy by not providing him with a sign language interpreter at school.

The boy who, according to Deaf Children Australia, has the academic skills of a six-year old was awarded $64,000 in compensation for future economic losses as a result of his inadequate education. The implications of this finding could prove to be a landmark decision for Deaf education in Australia as it establishes firmly deaf children's right to an AUSLAN [Australian Sign Language] interpreter in school." *SIGN Matters*, June 2005.

ACKNOWLEDGMENTS

We have been privileged to develop the concept of Deaf Gain within the context of ongoing conversations with colleagues and deaf people from around the world. Among these are our colleagues in the Department of ASL and Deaf Studies at Gallaudet University; those who invited us to present and engage in discourse on Deaf Gain; and deaf people who, in their daily lives, demonstrate how Deaf Gain is grounded in actual practice and lived realities.

This book exists because a large number of scholars saw the value of Deaf Gain and were able to share their research with our readers. We thank the authors of these chapters for their contributions to the ongoing development of this concept.

A project of this length and scope requires a tremendous amount of work behind the curtains. Our graduate-student assistant Rosie Ettenheim was an essential element in the book's final drive toward publication. Without her, you might not be reading this volume. In addition, Stephanie Hauke, an intern with our department, helped with our research on visual processing for our Introduction.

Whereas our colleagues have assisted us greatly in developing this book, our families have provided us with deep and sustaining support. Dirksen wishes to express his enduring gratitude for his wife, Nicole Salimbene, whose insights, ideas, and support are essential to every aspect of his life, and for his children, Noah-Grace and Caleb, who impart joy every day. Joe thanks his wife, Claudia, and his children, Joshua and Ella, for showing Deaf Gain in expressions of life and love each day together.

CONTRIBUTORS

DAVID ARMSTRONG retired in 2010 after a thirty-year career at Gallaudet University, where most recently he was executive director of the Gallaudet University Press. He is author, coauthor, or coeditor of six books and author of numerous articles about the Deaf community and the origin and evolution of the human capacity for language. His most recent book is a sesquicentennial history of Gallaudet University.

BENJAMIN BAHAN is a professor of American Sign Language and deaf studies at Gallaudet University. He has published articles, coauthored books, and written and directed videos in the fields of American Sign Language linguistics, literature, and cultural studies. He is also a well-known storyteller.

HANSEL BAUMAN is the campus architect and an adjunct faculty member at Gallaudet University and practices architecture as the principal of HB/a+p. His architectural design, planning, and projects in the United States, Europe, and Asia and his scholarly work explore the intersection of culture and architectural practice. In 2006, he established the DeafSpace Project, an ongoing research and campus-design effort in collaboration with the ASL Deaf Studies Department at Gallaudet University. He has lectured extensively on DeafSpace and architecture and represents the National Association of the Deaf on the International Code Council's Accessible Design Committee.

H-DIRKSEN L. BAUMAN is professor and chair of the American Sign Language and Deaf Studies Department at Gallaudet University. He is coeditor of the book/DVD project *Signing the Body Poetic: Essays in American Sign Language;* editor of *Open Your Eyes: Deaf Studies Talking* (Minnesota, 2008); and producer and codirector of the film *Audism Unveiled.* He is one of the executive editors of *Deaf Studies Digital Journal* (dsdj.gallaudet.edu), the world's first peer-reviewed academic and cultural-arts journal to feature scholarship and creative work in both signed and written languages.

JOHN D. BONVILLIAN is a faculty member in the Department of Psychology and Program in Linguistics at the University of Virginia. His principal research

interests include sign-language acquisition, childhood autistic disorder, handedness, the use of sign communication in the exploration of the New World, and psycholinguistics and deafness. In recent years, he has worked primarily on the development of a simplified manual-sign-communication system for special populations.

ALISON BRYAN holds an LLB (Hons) from the University of Birmingham. She has worked in positions from volunteer to senior manager, and she wrote the initial strategic plan for what became the first Deaf law center in the United Kingdom. She has a long history of grassroots activism, including in British Sign Language recognition and the Stop Eugenics campaign. She was a member of the advisory board for the University of Bristol's Genetics and Deafhood research study. She currently teaches undergraduate students in Wales.

TERESA BLANKMEYER BURKE is a philosopher and bioethicist at Gallaudet University. Her research focuses on the intersections of bioethics and disability, as well as ethics and the signing Deaf community. She has held leadership positions in both the signing Deaf community and the hearing-loss community, serving as the bioethics adviser to the World Federation of the Deaf and the U.S. National Association of the Deaf, a trustee for the Hearing Loss Association of America, and adviser to the American Academy of Hearing Loss Support Specialists. She has also published on signed-language interpreting ethics and is developing a project on virtue ethics and signed-language interpreting.

CINDEE CALTON is a linguistic anthropologist with a research focus on ideologies of language, identity, Deafness, and disability in education. She is a specialist in the Teacher Professional Development Group at the Science Museum of Minnesota, where she does work on access and equity in education. She is also an adjunct professor of anthropology at Black Hawk College in Illinois.

DEBRA COLE has a master's degree in linguistics from Gallaudet University and is studying bilingualism and language policy at Teachers College, Columbia University. She teaches history at the Lexington School for the Deaf in New York.

MATTHEW DYE earned his PhD in psychology from the University of Southampton, where he studied language processing in native and nonnative signers of British Sign Language. He is currently an assistant professor in the Department of Speech and Hearing Science and the Department of Psychology at the University of Illinois at Urbana-Champaign. His research focuses on the development of visual functions in deaf children, with a particular interest in

how visual attention skills are mediated by language and executive function in deaf children who use both spoken and signed languages.

STEVE EMERY has worked with Deaf people in many positions, including as development worker and counselor. He obtained his doctorate from the University of Central Lancashire in 2007 and has completed two postdoctoral studies at the University of Bristol. The first investigated the minority-group rights of Deaf people, and the second explored genetics from a Deafhood perspective. He is an honorary staff member at the University of Bristol and completed a visiting professorship at Gallaudet University in 2013.

OFELIA GARCÍA is professor in the PhD programs of urban education and Hispanic and Luso-Brazilian Literatures and Languages at the Graduate Center of the City University of New York. She has also been professor of bilingual education at Columbia University's Teachers College. Among her recent books are *Bilingual Education in the Twenty-First Century: A Global Perspective; Bilingual Community Education and Multilingualism;* and *Handbook of Language and Ethnic Identity, volumes 1 and 2*. For more information, visit http://www.ofeliagarcia.org.

PETER C. HAUSER is a deaf neuropsychologist and associate professor in the Department of American Sign Language and Interpreter Education at the National Technical Institute for the Deaf at Rochester Institute of Technology in New York. He is on the executive team of the National Science Foundation Science of Learning Center on Visual Language and Visual Learning. His research focuses on the impact of early sign-language acquisition on the development of advanced cognitive functions; his laboratory creates sign-language assessment instruments and consults other countries about how to develop similar tests.

GEO KARTHEISER received his undergraduate degree in advertising and public relations from Rochester Institute of Technology. He is a graduate student in linguistics at Gallaudet University and has assisted research on visual attention, brain plasticity, and signed-language assessment tools. His work investigates the impact of signed language as a second language on cognition and explores how scientists can improve their relationship with the public.

CAROLINE KOBEK PEZZAROSSI has worked at local, state, and federal levels in the rehabilitation and mental-health fields. Her background includes delivery of direct care as a counselor for people who are deaf or hard of hearing and motivation of individuals through independent-living skills and psychology to become productive members of society. She teaches psychology and has contributed to state and national forums related to people with disabilities.

Her research interests are in the areas of cultural interactions and communication, intimate-partner violence in the Deaf and hard-of-hearing population, and therapeutic interactions within the Deaf community.

CHRISTOPHER KRENTZ is associate professor of English and American Sign Language at the University of Virginia. He is the author of *Writing Deafness: The Hearing Line in Nineteenth-Century American Literature* and editor of *A Mighty Change: An Anthology of Deaf American Writing, 1816–1864*.

ANNELIES KUSTERS is a Belgian deaf anthropologist with degrees in philosophy, social and cultural anthropology, and Deaf studies. She investigates deaf people's lifeworlds in Mumbai, India, and Adamorobe, Ghana, and also has done research in Paramaribo, Surinam. She obtained her PhD at the Centre for Deaf Studies at the University of Bristol, and she is a postdoctoral researcher at the Max Planck Institute for the Study of Religious and Ethnic Diversity in Göttingen, Germany.

IRENE W. LEIGH is a deaf psychologist with experience in teaching, psychological assessment, psychotherapy, and mental-health administration. She taught in the clinical psychology program at Gallaudet University from 1992 to 2012 and chaired the Department of Psychology during her last four years at Gallaudet. Currently she is professor emerita. Her numerous presentations, research studies, and publications focus on deaf people and issues related to identity, multiculturalism, parenting, attachment, depression, and cochlear implants. She is a fellow of the American Psychological Association and was associate editor for the *Journal of Deaf Studies and Deaf Education*. Her recent books include *A Lens on Deaf Identities*; *Psychotherapy with Deaf Clients from Diverse Groups*; and *Cochlear Implants: Evolving Perspectives*.

ELIZABETH M. LOCKWOOD has collaborated with Deaf communities for more than twenty years as a teacher and researcher in Uruguay, Nicaragua, the Netherlands, Japan, the United States, and the Navajo Nation. She is a UN advocacy officer for CBM International, advocating for the rights of persons with disabilities.

SUMMER LOEFFLER graduated from Gallaudet University with a self-directed degree in art therapy and has a master's degree in deaf studies and cultural studies. She taught ASL and LSM/Spanish to Deaf high school students at the Texas School for the Deaf and now teaches ASL grammar and English courses at Austin Community College as well as deaf-culture courses for Gallaudet University. She works on interactive and educational ASL–English bilingual videos and has been involved with Deaf music and films in her studies of the musical niche of the Deaf Community.

MARA LÚCIA MASUTTI is a professor and coordinator of educational researchers at Instituto Federal de Santa Catarina, Brazil. Her research activities are in deaf education and cultural translation. She has contributed to the creation of Campus Palhoça Bilíngue Libras-Português at Instituto Federal de Santa Catarina, a center committed to technologies of deaf education.

DONNA A. MORERE has been a faculty member in the clinical psychology program at Gallaudet University since 1990 and is the neuropsychological assessment director of the National Science Foundation–funded Science of Learning Center on Visual Language and Visual Learning, Psychometric Toolkit and Early Education Longitudinal Study at Gallaudet University. Her research interests include primary-language disorders in deaf children; adaptation of neuropsychological assessment instruments for use with deaf and hard-of-hearing individuals; cognition, memory, executive-functioning, and attention assessment; and reading and language development in deaf children. She maintains a private practice in clinical neuropsychology, providing services to individuals who are deaf or hard of hearing using ASL, Cued Speech, or oral communication; since the early 1990s, the focus of this practice has been children with complex special needs, primarily those affecting language development.

KATI MORTON graduated from Utah Valley University with a degree in deaf studies and received a master's degree in deaf studies with an emphasis in deaf history from Gallaudet University, where she now works as a planning and research coordinator.

RONICE MÜLLER DE QUADROS has a doctorate in linguistics and is associate professor at Universidade Federal de Santa Catarina, Brazil, and a collaborator on the Development of Bimodal Bilingualism project with the linguistics department at the University of Connecticut. Her research is primarily in sign-language studies. She has written research papers and books about sign-language acquisition, sign-language grammar, bilingualism, deaf education, and sign-language interpretation.

JOSEPH J. MURRAY is assistant professor of American Sign Language and deaf studies at Gallaudet University. He studies Deaf people in society and transnational interconnections among Deaf people. He has been active in international human rights work for twenty years, serving as chair of the World Federation of the Deaf Human Rights Group. He has lectured on human rights, deaf studies, and history throughout the world.

DONNA JO NAPOLI, professor of linguistics at Swarthmore College, publishes widely in theoretical linguistics. In sign studies, she coauthors articles in the linguistic structure of sign language, the formal analysis of sign literature, and ethics regarding language choice for deaf children. She has coauthored a book comparing ASL and BSL humor, another comparing prosody across six sign languages, and a third comprising stories to help deaf children learn to read English. She works with Gene Mirus of Gallaudet University to produce bilingual ASL–English e-books. She has edited books about sign languages and has organized local, national, and international conferences. For more information, visit http://www.donnajonapoli.com.

JENNIFER NELSON is a professor in the English department at Gallaudet University. She studies English literature and culture, disability studies, deaf culture, and women's studies and has published on the use and function of the word *Deaf* in Shakespeare and the Renaissance, Deaf and mute women in modern film, and the function of Deafness in William Gibson's work.

LAURA-ANN PETITTO is a cognitive neuroscientist. Formerly at the University of Toronto, Petitto was recently recruited by the United States National Science Foundation to serve as both the coprincipal investigator and the science director of its Science of Learning Center, Visual Language and Visual Learning (VL2) at Gallaudet University in Washington, D.C. She is a full professor in the Department of Psychology at Gallaudet University, an affiliated full professor in the Department of Psychology at Georgetown University, and the scientific director of her own neuroimaging lab, called the Brain and Language Laboratory for Neuroimaging (BL2), at Gallaudet University. She is known for her discoveries concerning language and its neural representation in the human brain, young children's acquisition of signed and spoken languages, and "the bilingual brain" and "the reading brain." See http://petitto.gallaudet.edu/~petitto/index/.

SUVI PYLVÄNEN is a designer and teaches in the Department of Design at the University of Applied Sciences, Kymenlaakso. She received her master's degree in new media at the University of Art and Design Helsinki with a specialization in universal design in a user-interface design context.

ANTTI RAIKE is a senior adviser in accessibility at Aalto University. He received his doctor's degree in new media and a master's degree in film production at the University of Art and Design Helsinki, and a master's degree in education at the University of Eastern Finland. His postdoctoral research project, VIPP—Visual Innovations for Inclusive Projects with Diverse Participants—in 2008–2010 at Aalto University, was funded by the Academy of Finland.

PÄIVI RAINÒ is a sign linguist and principal lecturer in the Interpreting Training Programme at the Humak University of Applied Sciences. She received her doctoral degree in linguistics at the University of Helsinki. She has published more than sixty academic articles and other publications, as well as created multimedia productions in sign-language linguistics, the culture of Deaf people, and Finnish as a second language. She is a hearing CODA.

KATHERINE D. ROGERS has been active in the Social Research with Deaf People (SORD) group at the University of Manchester since 2006. She completed a Doctoral Research Fellowship funded by the National Institute for Health Research. Her research interests primarily involve Deaf communities and their families, especially on issues that promote positive outcomes. She is concerned about methodological issues that arise in research with d/Deaf people. Examples of her research projects include Deaf role models, the mental well-being of d/Deaf people, and the validation of standardized psychometric instruments with d/Deaf populations.

CLARA SHERLEY-APPEL is a PhD student in the Department of Linguistics at the University of California, Santa Cruz. She is interested in the intersection of morphology, syntax, and semantics, with a focus on Turkic languages.

TOVE SKUTNABB-KANGAS has written or edited fifty monographs and more than four hundred articles and book chapters, in forty-eight languages, about minority education, linguistic human rights, linguistic genocide, subtractive spread of English, and the relationship between biodiversity and linguistic diversity. She received the Linguapax Award in 2003 and the Vision Award from the California Association for Bilingual Education in 2013.

KRISTIN SNODDON is the David Peikoff Chair of Deaf Studies at the University of Alberta. She is the author of *American Sign Language and Early Literacy: A Model Parent–Child Program.*

ANDREW SOLOMON is a writer and lecturer on psychology, politics, and the arts. He won the National Book Award for *The Noonday Demon: An Atlas of Depression* and the National Book Critics Circle award for *Far from the Tree: Parents, Children, and the Search for Identity.* His books are published in twenty-four languages. He lives with his husband and son in New York and London.

KARIN STROBEL is professor and general coordinator of the Letras/Libras (Brazilian Sign Language) graduation course at Universidade Federal de Santa Catarina, Brazil. She was a deaf-education teacher in Curitiba, Paraná, Brazil, and a pedagogical team member for the Secretaria de Educação do Paraná. She

was director–president of Federação Nacional de Educação e Integração dos Surdos (FENEIS), a nonprofit organization dedicated to deaf people's rights. She is author of the book *As Imagens Do Outro sobre a Cultura Surda*. As a deaf woman and a professional, she experienced many historic moments during her life course in deaf studies.

HILARY SUTHERLAND, profoundly deaf from birth, is an experienced researcher in deaf education and has worked on many projects concerning deaf children and their families. Her research focuses on the quality of provision for deaf school students aged sixteen to nineteen years who attend continuing education in England.

RACHEL SUTTON-SPENCE has worked in the field of sign-language research since 1989 and has a special interest in creative sign language. She is currently at the Federal University of Santa Catarina, Florianopolis, Brazil. She is coauthor of *The Linguistics of British Sign* and *Analysing Sign Language Poetry*.

JAMES TABERY is associate professor in the Department of Philosophy as well as a member of the Division of Medical Ethics and Humanities at the University of Utah. He has published in a range of science and philosophy-of-science journals and is author of *Beyond Versus: The Struggle to Understand the Interaction of Nature and Nurture*.

JENNIFER GRINDER WITTEBORG is a documentary filmmaker and has made more than eight movies. With ten years' filmed interviews with Deaf and hearing signing people collected, she's making more movies analyzing social, political, and linguistic construction/constriction on Deaf and signing people's lives. A storyteller at heart, she loves watching other people tell their own stories. For more information, visit http://deafwittyproduction.wordpress.com/.

MARK ZAUROV is writing his doctoral thesis at the University of Hamburg on Deaf Jews in the arts, politics, and the sciences from the perspective of Deaf studies and in view of postmodern theories. He is the author of *Deaf Jews: A Double Cultural Minority* and has coedited *Overcoming the Past, Determining Its Consequences, and Finding Solutions for the Present,* about Deaf Jews and the Deaf community under the Nazi regime. He initiated and chairs the first Deaf Jewish association in postwar Germany and is a Deaf sign-language interpreter.

INDEX

abnormality, 23, 40–44, 51. *See also* normalcy
access, xx, xxiii, 405, 415; closed-captioning, xxiii, 53; filmmaking, 407; through interpreting services, xx, 11; social model of, xx; technology, 366; video relay interpreting, xx; Web design, 405, 415
Adamorobe, Ghana, 285, 287–92, 294–95, 297–300; sign language, 292
Akron, Ohio, xxvii, xxxvi, 306, 309–14, 316–18
Alexander Graham Bell Association for the Deaf and Hard of Hearing, 364, 366
Al-Sayyid, Israel, 291–92, 295
American School for the Deaf, 147
American Sign Language, xxxiii, 5–6, 14, 17, 67, 80–81, 96–98, 114–16, 124, 133, 136–37, 139–40, 146, 150, 193, 326; agreement verbs in, 83; baby sign, 149; classifiers, 223–24, 459, 462; curriculum, 245; exposure to, 150; gloss, 87; grammar, 82; haptic form of, 222; iconicity in, 119; interpreters, 5, 11, 207; as an "invented language," 115; legitimacy, 116–18; linguistic structure of, 81, 83, 90, 99; performers, 433; phonology, 68, 151, 154; poetry, 433, 450, 457, 466, 475; primary means of communication, 67, 203; recognition of, 452; reliant on, 358, 367; research, 124
Americans with Disabilities Act of 1990 (ADA), 398
anthropomorphism, 388, 465, 471–74
Arab American community, 5
arbitrary, 118
architecture, 375–76; awareness, 376; cultural identity, 376; Deaf, 379; Deaf-architectural pattern language, 379, 394, 396–97; discourse, 379, 398; expression, 376; pattern language, 377–82, 384–85, 390–91. *See also* DeafSpace
Aristotle, 24–25
Armstrong, David, xxviii, xxxiv, 117–18, 121, 123
Armstrong, Thomas: *Neurodiversity*, xxi–xxii, 33
assimilation, 49, 237, 291, 424
attention, 195, 198; spatial, 206; systems, 197
audiologically deaf, xvi, 16, 19, 225, 359
audio-vocal orientation, 247; meaning, 248
auditory sense, xv, 212; deprivation, 443; information, 357; input, 15, 220, 360–63

baby sign, xxxi, xxxv, 140, 146, 149, 153; ASL, 149; for hearing infants, 146; programs, 147
Baffin Island, 159–60, 162–64, 169–70, 172; otitis media, 174
Bahan, Benjamin, xxxv, 223, 358, 377–78, 385, 388, 439, 447
Bakhtin, Michael, 107
Ban Khor, Thailand, 291
Bartlett, Katharine, 55
Battison, Robbin, 115–16
Bauman, Dirksen, xxvi, 4, 19, 95, 112–14, 249, 269, 343, 358, 377, 388, 439, 468
Bauman, Hansel, xxx, xxxvii
Bavelier, Daphne, 133, 200, 204, 206
Baynton, Douglas, xxi
Beardsmore, Hugo Baetens, 98
Bell, Alexander Graham, 20, 423
Bell, Mabel Hubbard, 423
bell curve, xvi, 25. *See also* normalcy
Bellugi, Ursula, 68, 99, 115, 118, 135, 138, 140
belonging, xxv, xxxvii, 223, 244–45, 247, 364–65, 367
Bengkala, Thailand, 285, 287–92, 294–95, 297–99
Benton Test of Facial Recognition, 135, 137
Best, George, 162
Bilingual Education in the Twenty-First Century (García and Cole), 98

bilingualism, 13, 95–99, 101–3, 107–9, 146, 151–53; additive, 105–6; bicultural, 277; bimodal, 149–52; child, 102, 150; Deaf, 95, 98, 101–2, 104–5, 107–9; deaf experience, 98; deaf school, 154; dynamic, 105–6; education, 95, 99, 103, 107–8, 273, 321, 323, 342; hearing, 102, 106–7; immigrants, 96, 98; international education, 96; pedagogies, 96, 99, 107–8; students, 101, 150; study of, 98, 107; subtractive, 105–6; teachers, 153, 155; theoretical framework, 95
bioethics, 3, 112; bioethical communities, 31
bipolar, 24, 33–34
"Bison Song," 445, 448–50
Blankmeyer Burke, Teresa, xxxiii, 47
blindness, 11
Booth, Edmund, 286
body, 182–83, 377, 457; concepts of, 438; connections, 184; language, 50, 185, 212, 275–76, 483–84, 490; motion, 182; movement, 182–83; muscles, 182
Bonvillian, John, xxviii, xxxv
"border thinking," 98
Bourdieu, Pierre, 291
Boye-Niemela, Janne, xvii
Bragg, Bernard, xxxi, 459
brain, 27, 33, 59, 83, 86, 204–5; cognitive processes, 13; human, 66–73, 140, 197; language area, 90, 123, 133; modalities, 113; phonological module, 91; processing, 117; research, 141; sign language and, 65, 134
Brazilian Sign Language, 341–47, 353; Federal Decree 5626, 341–43, 345, 347, 353; teaching, 342–45
British Deaf Association, 42
British Sign Language, 272–73, 275, 278, 457
Bryan, Alison, xxxiv
Bulwer, John, 182–85; deafness rhetoric, 182–83; *Pathomyotomia,* 182; *Philocophus,* 182–83, 187

Calton, Cindee, xxxiv
Carlin, John, 426–27
Cerf, Vincent, xxix, 20
Chaucer, 67
Chinese Sign Language, 140
Chirologia (Bulwer), 182–87
Chironomia (Bulwer), 182–84, 186–87
Chomsky, Noam: *Syntactic Structures,* 67–68, 83, 87, 124, 442–43; theories of language, 90
CinemaSense project, 402–3, 405–9, 411, 415
"citizen of the world," xxvi; while traveling, xxvi; visual citizens, xxvi
Clerc, Laurent, 422, 424–26, 432
co-design, 402–7, 409, 411–12, 415–17
co-equality, 47
cochlear implants, xvi, 13, 48, 101, 142, 206–7; in deaf children, xvi, 141–42, 221, 356–57, 363; deaf subjects with, 201; medical intervention, xvii, xxxviii; pediatric implantation, xvi; popularization of, 356; use of, 10
CODAs (children of deaf adults), 16, 19, 101, 322, 332, 336
code-mixing, 107, 122
code-switching, 99, 107–8
cognition, xxiv, 20, 123, 150–51, 154; abilities, 9; advantages, 133; awareness, 211; detection, xxvi, 50; development, 143, 216; facial, xxiv, 135–36; functioning, 134; gains, 143, 146; mental-rotation skills, 139; motion processing, 134, 139; peripheral vision, xxiv, 10, 15, 50–51, 193, 202, 204, 206; processes, 150; psychological, xxvi; spatial, xxiv, 137, 146, 151–52; tactile, 217; visual, 10, 50–51, 146, 149, 151–52; visual memory, 137; visual processing, 71, 73
Cole, Debra, xxviii, xxxiv, 95–98, 106, 108; *Bilingual Education in the Twenty-First Century,* 98
"collaborative descriptive inquiry," 97
collaborative learning, 402, 406–9, 411
collective leadership, 325–26, 329–32, 338; understanding, 276
communication, 5, 15, 122; auditory mode, 8; auditory-verbal, 13, 133, 148; barriers, 159; bimodal, 13, 149; disorder, 147; gestural, 146; human, 122–23, 212, 225, 234; manual, 14, 159–60, 164, 169–71, 175–76, 292–93; in sign language, 146, 382; spoken-language, 7, 65, 66, 85, 146; technology, 88, 91; via touch, 212, 215; visual-gestural, 74, 291–93; visual medium, 88–91, 457, 133; written, 7
Condillac, Étienne, 133
"contact signing," 104
contrast sensitivity, 195
Corballis, Michael, 86, 123
Corsi Blocks Task, 137
Cratylus (Plato), 77
critical race theory, 39, 51, 53, 55
Cued Speech, 91, 366
culture, xviii, xxvi, 33, 89, 121, 233; behaviors

of, xxvi, 240; boundaries, 250; cross-conflicts, 246; cultural studies, 4; evolution, 77; expectations, 251; framework of, 89; indigenous, xviii; knowledge, 246, 250–51; languaculture, xv; monoculture, xviii; norms, 12; practices, 245; sociocultural orientation, 16; studies, 252
"cultural customization," 378, 382, 390, 399

Darwin: *Origin of Species*, 78–79, 89
Davis, Lennard, xv
Deaf activists, 38, 116, 333
deaf artists, 426, 483–84, 486
Deaf bilingualism, 95–99, 101–2, 104–5, 107–9; theoretical framework, 95
deaf-blind, 223–24
Deaf-centered, 270, 278, 280
deaf children, 12, 16, 38, 53, 69–71, 122–23, 134–35, 138, 141–42, 147, 154, 193–95, 204, 206–7, 278; deaf babies, 41–42, 46, 133; linguistic repertoire of, 103; of deaf adults, 19, 53; of hearing adults, 53, 103, 322; parents of, 140–41; sign-language users, 272. *See also* deaf education
deaf club, 376
deaf commonwealth, 286, 375
Deaf culture, 24, 33, 54, 68, 100, 117, 211, 225, 269, 330, 359, 399–400; collectivist culture, 387–88, 390, 399; cultural community, xvi, 5, 17, 19, 42, 66, 68, 364; haptic events in, 223; music, 438, 452, 447; role of architecture in, 388; values, 241
deaf/Deaf native signers, 140, 200, 202–3, 206–7, 272, 443
deaf donor, 41, 44, 54
deaf education, xvi, xxxi, 50, 78, 81, 90, 223, 279, 289, 347, 424; bilingualism, 95, 98, 101–2, 104–5, 107–8
deaf embryo, 45, 53, 54. *See also* embryos
Deaf experience, 8–9, 38, 77, 88, 280, 379, 382, 426, 494
deaf film, xxxi, 69, 439; filmmakers, xxi, 406, 409–10, 479–80. *See also* digital technology: vlogs
deaf focus, 10
deaf framework, 280
deaf home, 376; owners, 378
Deafhood, 38
Deaf identity, 101, 109, 331–32, 353, 399; as social agent, 345, 351, 353. *See also* identity
deaf identity, 331, 426. *See also* identity
deaf jokes, 68
Deaf jurisprudence, 37–39, 46–47, 49, 51, 56
deaf lens, 56, 99, 451, 490
deaf literature, 451
Deaf music, 436–38, 444, 449
deaf-mute identity, 248
Deaf Mutes' Journal, 310–13, 316
deafness, xv, xxxix, 20, 23, 41, 43, 104, 112, 195, 422; attempt to cure, xxxviii; audiological, 5, 10, 16; biological, xix, 287; cultural construction, 438; deabnormalizing, 24, 33; deviation, xvii; disorder, 34; eradicate, 16, 46; fear of, 432; hereditary form, 285, 289, 292, 295; ideologies, 121; isolation, 11; medical disability, 404; naturalness of, 425; perspective on, 297; privation of, xxxiii, 3, 19; reframing, 285, 438; seclusion, 33; social construction of, 291; and vision, 206
deaf nonsigners, 135, 138, 143, 272
Deaf norms, 47, 344, 346
Deaf perspective, 41
deaf perspectives, 41, 108, 206, 270, 276, 377, 402, 485; cultural, 272; of music, 444
deaf privation, 8–9
deaf researchers, 138, 270, 273, 275–76
deaf residential schools, 306–8, 330, 333, 375, 426, 452; newspapers, 306, 310
Deaf role model, 276
deaf signers, 135–37, 139–40, 143, 203
DeafSpace, xxx, xxxvii, 10, 358, 377–400; origins of, 379; Workshop at Gallaudet University, 380–81, 391
deaf speech, 248–49; grunt, 249–50; laughter, 250
deaf state, 375
Deaf storytellers, 154, 239, 459, 472, 480, 485
deaf students, 79, 154
deaf studies, xx, 17; scholars, 457
deaf traditions, 68
deaf utopias, 286–87, 300
deaf village, 292
deaf women, 41, 311, 316, 325, 327
deaf workers/employees, xxvii, xxxvi, 306–14. *See also* Akron, Ohio
decibels (dB), 244
Dee, Dr. John, 161–63
Deech, Baroness Ruth, 37, 39–41
Desloges, Pierre, xxvii, 3, 6, 133, 142
De'VIA, 478, 482
digital technology, xxxii; visual communication, xxxii, 88–91; visual journals, 69; vlogs, xxxii

diglossia, 106, 108
disability, xx–xxii, 44–45, 188, 322; activists, 55; antidiscrimination legislation of, 49–50; autism as a, xxii; cultural model, xxi; disability studies, xx, 51; dyslexia as a, xxii; emergence of, 277; groups, 40, 117; label of, xxi; learning, 276, 411; national legislation, 323; people with, xx, xxxii, xxxix; social model of, xx; studies, 51, 188, 438
discrimination, 43–45; genetic, 44
divergent thinking, 402, 404–5, 409, 417
diversity, xv, xvii–xxiii, 56, 269, 280, 287; biocultural, xvii–xix, xxvii, xxxii, xli; bodily, xxii; biodiversity, xviii–xxii, 20, 51, 357; biolinguistic, xviii, xxxviii, 56; biological, xviii, xxvii, 19, 46, 50–51, 124; celebration of, 49; cultural, xviii, 19, 51, 357; disability as, xx; discourse of, xx; human, xix, xxxii, 19, 56, 269, 271, 285, 299, 300, 356–58; human experience, 432; language, 160; linguistic, xviii, 51, 56, 95, 98, 124, 294, 357; music therapy, 440; natural, 294, 297, 425; neurodiversity, xxi–xxii, xxxii, xxxix; physical and cognitive, xxi, xxii; recognition of, 49; sensory, 357
donor, 41–42; selection, 41. *See also* deaf donor; genes
doors, 242–43, 441
Du Bois, W. E. B., xxxvii, 421–22, 426
Dudis, Paul, 381
Dye, Matthew, xxiv, xxxv, 203–4

Edison, Thomas, xxvii, xxix, 20
education, xvi; auditory, xvii; bilingual, xvii, xxxi, xxxiv, 95, 99, 103, 107–8, 273, 321, 323, 342; deaf education, xvi, xxxi, 50, 78, 81, 90, 223, 279, 289, 347, 424; Deaf Gain education, xxxi; exclusion from, 49; international bilingual, 96; oral, xxiii, 79
e-learning, 341, 347–51; Deaf–Deaf meetings, 341, 343, 348–50, 352, 353; modality, 348; virtual environment of teaching and learning (VETL), 348
embryos, 39–40, 55; abnormal, 41–42, 45; embryo testing, 39; live human, 39
Emery, Steve, xxxiv
Emmorey, Karen, 135–36, 138, 152
English, xxix, 65, 67, 71, 97, 116, 133; literacy, 151; reading, 72–74; as a second language, 272; spoken, 5–6, 66, 18, 79, 115; vocabulary, 150; written, 14
equality, 46–49, 51, 56, 117
essentialism, 24–26, 55; essentialist thinking, 26, 29, 33; "natural state model," 25
ethics, 20; committee, 43
ethnicity, 51; Deaf people as an ethnic group, 51
eugenics, xvi, 42
European Court of Human Rights, 44
European Union of the Deaf, xvii, 143
evolution, 77–78, 85, 89; biological, 83; language, 78–79, 81, 123
exogenous orienting, 198–201, 205; visual, 201, 204
eye contact, 11–13; communication, 388
eye gaze, 12–13, 15, 71, 198–99, 238, 358; behavior, 239; G-gaze, 239; grammar, 238; I-gaze, 239

facial expressions, 136, 176, 261, 275, 362, 460, 482–84, 488
facial recognition, xxiv, 135; processing, 136; skills, 135
Fairclough, Norman, 113
feminism, 4; legal theory, 48; philosophy, 4; scholarship, 52; theory, 39, 55–56; third-wave, 55
film, xxxi, 248, 260–61, 406–11, 415, 447; studies, 433
Finnish Sign Language (FinSL), 407, 409
Firestone factory, 306, 313–16, 318–19
Fitch, W. Tecumeseh, 87
Flournoy, John J., 286, 375, 427
Foot, Philippa, 26, 30
Ford, Henry, 308
French Enlightenment, 78
Friedman, Lynn: *On the Other Hand*, 116
Frishberg, Nancy, 119
Frobisher, Martin, 159–76

Gallaudet, Thomas Hopkins, 147, 424
Gallaudet University, xxxix, 4, 6, 10, 67, 80, 97, 133, 245, 251, 315, 333, 377, 390–91, 394, 481–82; alumnus of, 310; ASL and Deaf Studies Department at, 377, 381; "Bison Song," 445, 448–50; English Language Institute at, 97; Living and Learning Residence Hall Number 6 (LLRH6), 391, 394, 398; Sorenson Language Communication Center (SLCC), 380, 391–91
Garcia, Joseph, 147
García, Ofelia, xxviii, xxxiv, 95–97, 105, 107–8
Gardner, Allen and Beatrice, 80–81

gedankenexperiment, 4, 9
genes, xxiii, 26, 39–40, 50, 86; condition, 43; deaf gene Cx26, xx, 43, 289; deictic, 148; gene–environment interaction, 26, 29, 31–32; genetic carriers, 41; genetic characteristics, 16; genetic disorder, 40, 85; genetic predisposition, 23, 31–32; genetic selection, 46; genetic variation, xxiii, xviii, xxxix; as reason for deafness, xix, 195, 286, 288
gesture, 67, 77, 85, 121–24, 148, 159–60, 167–71, 182–88, 234, 293; analyses of, 186; behavior, 84; "carriers of meaning," 185; communication, 84–85, 146–48, 164, 167; codified, 171; gesture-prone environments, 288, 293; grammatical patterns, 133; hypothesis, 80; iconicity of, 84; intersection with speech, 183; modality, 121; origin for language, 79, 86, 123, 147, 235; origins theory, 86, 121; pantomime, 171; sign language, 122; symbolic, 148; systems of, 234
Gilbert, Humphrey, 161–62, 169
Ginsberg, Allen, xxx
Glennie, Evelyn, 445, 487
Goldin-Meadow, Susan, xxxi, 122
Goodyear factory, 306, 309–15, 317–18
Graham, Sylvester, 88
Gramsci, Antonio, 113
grassroots, 321–22, 324, 328, 330, 332–33

habitus, 47, 291, 300–301; deaf-inclusive, 300
Hall, Christopher, 163–66
hand shapes, 122, 153, 175, 223–24
haptic, 212, 217–19, 221, 442; abilities, 216; communication, 218; events, 212–13, 221; exchanges, 213; foundation, 219; guidance, 219; inappropriate events, 213; information, 218; interface, 218; knowledge, 218; perception, 218; sense, 218; sensitivity, 219–22; skills, 219; system, 217; working memory, 218. *See also* tactile sense; touch
hard of hearing, 13, 15; children, 141; culture, 15. *See also* oral deaf
Harlan Lane, Lennard, 51
Harmon, David, xviii
Hartford, Connecticut, 331, 424, 430
Harvard University, 68
Hauser, Marc, 87
Hauser, Peter, xxxii, xxxiv, 204, 276, 443
hearing, xv–xvi; accomplishment, 7; biological aspects, 17; constructions, xxvi; construct of deaf, 48; cultural community, 5, 11, 17; cultural practices, 7; culture, 3, 6, 17; deprivation, 9; impairment, 49; native signers, 202; nonsigners, 135–40, 203–4, 443; parents, 146; researchers, 270; sense, xv, 212, 441; signers, 114, 135–36, 138–39, 143; students, 154; values of being, 17; visual and auditory experience, 197; world, 6, 9, 19, 273, 365
hearing aids, 4–6; digital, 13; removal of, 8, 10; users, 6
hearing children, 12, 15, 17, 53, 69, 102–3, 106–7, 133, 141, 147–51, 153–54, 195; bilingual, 102; of deaf adults, 18, 251
hearing line, 421–24, 428, 431–33
"hearing loss," xxxviii, 7, 18, 33, 88, 112, 207, 269, 297; loss of hearing, xv, xvii, xxix, xxii, 3, 16–17, 269
Hearing Loss Association of America, 15
hearing privation, xxvii, 3, 5, 8–10
Hear the World (magazine), 8–9
Hewes, Gordon, 78, 80
home sign, 234, 292–95
horizontal learning, 53; transmission, 54
Horowitz, Tamara, 4
Hull, David, 23, 29–30, 32
Human Fertilisation and Embryology Authority, 38, 41
human rights, 44; campaigning for, 49; of deaf people, 4; violations, 332. *See also* legislation
Humphries, Tom, 19, 37, 47, 424, 439
Huntington's disease, 24, 34; culture, 33

iconicity, 70, 77–78, 118, 122, 459; American Sign Language, 119; gestures, 84, 123; sign language, 82, 86, 91, 118
identity, 4, 50, 100–101, 117, 154, 147, 250; alliances across, 422; collective, 331–33; connections, 364; cultural self, 4; deaf, 331, 426; fluidity, 100
ideology, 112–16, 123; assumptions, 114; construct, 121; folk, 113; language, 113–14, 116; sign language, 113–16, 121; of sound, 245
imagery, 121, 123
imagined communities, 287
intersectionality, 38, 55–56
intimacy, 11–13, 15
Inuit populations, 160, 164–69, 173–76, 213; culture, 168; gestures, 172; linguistic situation of, 172; sign communication, 160, 166–68, 173–75; spoken language, 160, 168; tongue, 160

in vitro fertilization (IVF), 39, 44; embryos, 41
Italian Sign Language, 66, 68, 97–98, 152

Japanese Deaf community, 117
Japanese Sign Language, 117
jurisprudence, 37

Kahne, Bruno, xxvii
Kant, Immanuel, 11
Kartheiser, Geo, xxxii, xxxiv, 204
Keller, Helen, 11
King, Barbara, 84
Kitunen, Suvi, 406
Klima, Edward, 99, 115, 118, 140
Knack project, 402–3, 405–6, 411, 415
Krentz, Christopher, xxxvii
Kusters, Annelies, xxviii, xxxviii, xxxvi

Ladd, Paddy, 47, 149, 223, 325, 336
language, 65–67; acquisition, 69–70, 97; additional (AddL), 102; advantages of learning, 136; autonomous system, 99; awareness of, 150; biological foundations, 66; development, 69, 123, 148; disappearance, 89; evolution, 78–79, 81, 123, 236; home, 98, 102; human, 67, 72, 80, 82, 121, 124, 149, 187, 432; ideology, 113–14; majorities, 96, 106; minorities, 95–96, 106, 108–9, 117; modalities, 101–2, 104–5, 113, 119, 123, 134; natural, 133, 234; origin, 78, 84–85, 88, 147; perceptions of, 113; practices, 95, 108; processing, 134, 137; proficiency, 147, 154; prosodic features, 134; skills, 101, 108; social construction of, 99–100; study of, 114, 118, 124; visual nature of, 235; visual-spatial, 144, 357. *See also* home sign; sign language; visual language
languaging, 100–102, 104, 107; deaf, 100, 104; fluid, 105; process of translanguaging, 107–8; simultaneous, 104. *See also* literacy; oracy; signacy
Laurent, South Dakota, 286, 375
legal theory, 37–38, 49, 56; critical, 47
legislation, 38, 42; for deaf children, 38; for Deaf people, 40; disability, 49; framework, 38
Leigh, Irene W., xxxvi
Lengua de Senas Uruguaya (Uruguayan Sign Langauge), 323
l'Epée, Abbé de, 78, 188, 440–41
Levitin, Daniel, 436–37, 441, 443–44, 451; *The World in Six Songs*, 437, 441
lexical, 67, 70, 81, 87, 134
Libras Law, 341–44, 345–54; Letras Libras courses, 346, 348–55
Liddell, Scott, 82, 114, 120, 122
linguistics, 67, 78, 80–81, 113–21, 123–25; anthropology, 113; behavior, 87; cognitive, 124, 443; gain, 146; generativist school of, 81; hierarchy, 106; homogeneity, 160; metalinguistics, 150–53; milestones, 148–49; policy, 342–43, 346; sign, 115; Society of Paris, 78–79; spoken-language, 124; theory, 473–74
lipreading, 14, 103. *See also* speechreading
literacy, 71, 73, 96, 101–5, 155; for Deaf children, 446; emergent, 146, 151; English, 151
literature, xxx, 242, 422, 428, 433, 447; ASL, 154–55; Deaf Gain, xxxvi–xxxvii; Deaf-literature scholars, 448; deaf presence in, 428–32; minority, 427
Little Paper Family (LPFs), 306
Lockwood, Elizabeth, xxvi, xxxvi
Loeb, Gerald E., xvi
Loeffler, Summer, xxxvii
London Philological Society, 79
Lucas, Ceil, 104

Maffi, Luisa, xviii
mainstream, 4, 8; education, 48, 96, 357, 481
majorities, 96; languages, 96, 106, 280
Makoni, Sinfree, 99–100, 104
Mallery, Garrick, 149–50
Malzkuhn, Matthew, 378, 387
manual signs, 159–60, 164, 169–71, 175–76, 185; communication, 169–75; interaction in, 167; use in hunting, 172; use in North America, 161
Martha's Vineyard, Massachusetts, 285–88, 292, 294, 296, 298, 300
massage therapy, 214–16
Masutti, Mara Lucia, xxxvi
Matovich, Megan, xxvi
McCullough, Stephen, 135–36
McKee, David, 138
McNeill, David, 121–23
Melville, Herman: *Moby-Dick*, 428
memory, 136; advantages, 137; human, 218; modality of, 218; spatial, 137–38; tactile, 218; visual, 137–38, 218
metaphor, 468
Mignolo, Walter, 98

Milan, International Congress on the Education of the Deaf (1880), 79
Miles, Dorothy, 457–58
Mills, Mara, xxiii
mime, 172, 459–60, 473–74
minorities, xxxviii, 47, 56; communities, 280; experience, 422; group, 328; identity, 333; immigrants, 97; indigenous, 98; language, 95–96, 106; literature, 427
Minow, Martha, 50
Moby-Dick (Melville), 428–30
modalities, 101–2, 104–5, 113, 119, 123, 133–34, 147–48; advantage, 148; gestural, 149
monolingual, 101, 342, 346; children, 150; students, 150
Morere, Donna A., xxxvi
morphology, 71, 87, 133–34, 238–39, 464
Morton, Kati, xxvii, xxxvi
Muller de Quadros, Ronice, xxxvi
Murray, Joseph, 4, 19, 47, 95, 112–14, 269
music, 436–37; deaf, 436; deaf perception, 444; education for deaf, 440, 451; feeling, 442; influence of, 437; role of, 437; understanding of, 452

Nagel, Thomas, 9
Napoli, Donna Jo, xxxv
National Association of the Deaf, 112, 316, 433
National Institute of the Deaf in Paris, France, xxiii
National Science Foundation Science of Learning Center on Visual Language and Visual Learning (VL2), xxxi, 71, 133
National Technical Institute for the Deaf, 248, 449
National Theater of the Deaf (NTD), 480
Native Americans, 159, 161, 164, 425; nations, 172; otitis media, 174
Nelson, Jennifer, xxxv
Nettle, Daniel, xviii
Neurodiversity (Armstrong), xxii, 33
nonsigning deaf, 14
normalcy, xv–xvii, xxxix, 23, 30–32, 38, 46, 48, 51, 291, 356; act of normalizing, xvi, xvii; "the age of," xvi; boundaries, xxiii, xxxii; definition of, xvi; development of, 51; deviation, xxi, 49; normal vs. abnormal, 23; paradigm, 34; pathological, xvi, xx; standards, xv
North American Indian Sign Language, 160

Oaxaca, Mexico, xxvi, 193; deaf police officers in, 193
On the Other Hand (Friedman), 115
oppression, 47, 55, 299, 311, 432, 440
oracy, 101–5
oral deaf, 15–16, 202, 204, 359, 366–67
oralism, xvi, 14, 308, 424
"oral method," 13; instruction, 79
Origin of Species (Darwin), 78
Ortiz, Fernando, 107

Padden, Carol, 19, 116, 375, 424, 439
paralinguistics, 121
Parasnis, Ila, 101, 199–200
Pathomyotomia (Bulwer), 182
Peace Corps, xxvi
pedagogy, 96, 99, 107–8
Peikoff, David, 155
Pennycook, Alastair, 99–100, 104
perception, 194–95, 197
peripheral vision, xxiv, 10, 15, 50–51, 193, 198, 201–6, 240–41
Peters, Cynthia, 286, 446, 447, 471
Petitto, Laura-Ann, xxviii, xxxiv, 133, 140, 149, 443–44
Pezzarossi, Caroline Kobek, xxxvii
phenomenology, 3, 6; phenomenological experience, 8, 16, 19
phenotype, 26, 29
Philocophus (Bulwer), 182–83, 187
phonology, 68, 81, 116, 133–34; American Sign Language, 68, 151, 154; language organization, 72; semantic, 78, 86–88, 116; sign language, 70–71, 82, 139; system, 86; visual, 72
Plato, 24; *Timaeus*, 24; *Cratylus*, 77, 234
"plurilingualism," 105; development, 108; practices, 106
poetry, 433, 450, 457–59, 464; signed poetry, 461–64, 466–69, 475
Poizner, Howard, 139–40
Posner cuing program, 198, 200–201
preimplantation genetic diagnosis (PGD), 39–40, 43, 55
productive ability, 103; sensory systems, 117
proxemics, 239, 241, 382
public speaking, 182–84, 186–87
Pylvanen, Suvi, xxxvii

queer legal theory, 48, 56
Quetelet, Adolphe, 25. *See also* bell curve

Raike, Antti, xxxvii, 406
Raino, Paivi, xxxvii
receptive ability, 103, 154, 361; sensory systems, 117, 244
reproduction, 39; assisted, 39, 41; reproductive liberty, 46
rhythm, 436, 444; creating, 445; indigenous, 447; song signing, 446; tactile, 436; visual, 441
Rochester method, 91
Rogel, Kelly, xxvi
Rogers, Katherine, xxxii, xxxvi, 269, 276
role shifting, 238–39, 473
Romaine, Suzanne, xviii
Rosenfeld, Sophia, 78
Russo, Tommso, 120

Salk Institute for Biological Studies, 68, 80, 135, 443
Samar, Vince, 199–200
Saussure, Ferdinand de, 118–19
Schneps, Matthew, xxii
sensation, 194–95, 197
sensory orientation, xv, xxxv; absence of a sense, 220; deprivation, 220; experience, 8, 10, 223, 359, 377, 436; hierarchy, 376; modality, 197, 205, 212; multisensory orientation, 385; norms, 252; organ, 214; politics, 252; processing, 198; reach, 241–42, 385; system, 197, 205; threshold, 389; world, 378
Sherley-Appel, Clara, xxviii, xxxv
signacy, 102–5
sign gain, 134, 137, 142–43, 194, 204, 207
Signing Exact English (SEE), 5, 90, 153
sign language, xvi–xix, 11, 42, 65–66, 73, 78, 82, 105, 112, 114, 120, 123, 146, 151, 154, 164, 221–25, 234, 356, 382; aboriginal, 293; autonomous system, 99; awareness/acceptance/recognition of, xx, 42, 48, 90, 115, 123–24, 269, 277; behavior of, 115; biological equivalence, 63, 67, 69, 71, 73; biological properties of, xxviii; brain exercise, 143; classifier constructs of, 134; communicating with, 12–13, 164; competency, 135–36; creative, 458; diversity of, 125; emergence of, 175, 285, 293; and endangered languages, xvii, xli, 89, 142–43; evolution of, 236; and extinction, xvi–xvii; gain, 134; gestures, 122, 159; iconicity, 84, 91, 118–20, 124; ideology, 113–16, 120; infant, 146; input, 147; interpreter, 98, 101, 321, 329, 334, 344, 346; learning, 134; in literature, xxx, xxxvii; local, 292; manual, 159–60, 164, 169–71, 175–76, 185; monastic, 171; native, 147, 153–54; phonology, 70–71, 82, 139; poetry, xxx, 224, 459; processing, 137–39; recognition of, 38, 80, 117, 188, 452; social acceptance of, xx; study of, xix, 77, 114, 159; tactile, 224; visual, 193
sign-language communities, 285, 424; deaf inhabitants in, 289; deafness in, 288; perception of ambiguity in, 295–96, 301; shared, 285–301, 366
sign linguistics, 99–100, 115, 119, 124; analyses/study, 67–68, 77–78, 80, 82
silence, 436, 439, 449
Silent Hoosier, 311, 314, 317
Silent Worker, 307, 312, 441, 450
Silverstein, Michael, 113
simultaneous communication (SIM-COM), 5, 153
Sirvage, Robert, xxv, 241, 377
Skutnabb-Kangas, Tove, xviii, xxxvii
Slobin, Dan, 463
Snoddon, Kristin, xxxi, xxxv
Sober, Elliott, 23, 25, 30, 32
Socrates, 77
somasensory, 218, 222–24; system, 224
sound, 8, 17, 120, 240, 244; absence of, 71; concept of, 450; control of, 250–53; experiences of, 440; modalities of, 102; reading for, 241; sound-based iconicity, 77; sound-based information, 270; tactile feeling of, 245; vibrations, 223, 244, 442
Spanish, 5, 96; spoken, 5, 324
spatial awareness, 379, 382, 389, 400; connection, 396; distances, 382; language, 444; orientation, 385; relationship, 388; sensibilities, 397
speech language pathology, 147
speechreading, 5, 13–14, 362–63; classes, 13; lipreading, 14; speechreaders, 14; therapists, 96
spoken language, 11–15, 17, 22, 65–66, 71–73, 75, 85, 90–91, 100, 102–3, 114, 117, 119–23, 125, 134, 148, 182–88, 224, 347; barriers, 172; deaf, 366; development of, 148; exposure to, 359; intersection with gestures, 183; linguistics, 125; modality, 346; preference for, 359; skills, 271
Stokoe, William, xxviii, xxxi, 67–68, 77, 80–82, 85–87, 99, 117, 123–24, 133
"Stop Eugenics" campaign, 42, 46, 55. *See also*

U.K. Human Fertilisation and Embryology Act 28
Straus, Joseph, 438, 440, 446, 451
Strobel, Karin, xxxvi, 345, 349
"subaltern knowledge," 98
Sutherland, Hilary, xxxii, xxxv, 269, 272–73, 279
Sutton-Spence, Rachel, xxxvii, 224
Switched at Birth (television series), xxxiii
Syntactic Structures (Chomsky), 67
syntax, 14, 71, 82, 87–88, 119, 123, 133–34, 151, 238–39

Tabery, James, xxxiii
tactile sense, 211–12, 214, 219–22, 452; awareness, 216–17; cognition, 217; memory, 218; multimodal, 211; sensation, 217; skills, 220; stimulation, 215, 221; "tactile party," 245. *See also* haptic; touch
Taub, Sarah, 82–83, 119–20, 124, 223
teachers, 78, 98, 154, 239, 247–48, 342–45, 352, 398; deaf adult, 153–55; hearing teachers of the deaf, 322, 336; nonsigning, 286
text messaging, xxiii, 365
"theory of mind" (ToM), 141; learning a sign language, 141
Thompson, Michael, 25–26
Timaeus (Plato), 24
touch, 211, 214, 378, 442; acceptance, 246; benefit of, 214–16; interpretation of, 245; misunderstandings, 245; stimulation, 215. *See also* haptic; tactile sense
transculturación, 107
"transglossia," 106–7
transnational, xxvi; benefits and gains of, xxvi

U.K. Human Fertilisation and Embryology Act 1990, 39
U.K. Human Fertilisation and Embryology Act 2008 (HFEA), 23–24, 26, 30–31, 37–39, 43, 46, 49, 51–52; Section 14(4)(1–13), 39; Section 14(4)(9), 40, 42–43, 45, 48–49, 53–55
UNESCO, xv, xvii, xviii
United Convention on the Rights of Persons with Disabilities, 38, 44
United Kingdom, 38–40, 52; Department of Health, 39–40; House of Lords, 42; Parliament, 40–43
University of Pittsburgh, 4
Uruguay, 321–39; deaf community, 321, 323–25, 328–30, 336–38; Lengua de Senas Uruguaya (Uruguayan Sign Language), 323–24, 326

Valli, Clayton, 104
Veditz, George, 112, 234
vibration, 217, 223, 244
vision, 194, 196, 204, 206, 212, 238–43, 246, 358–60, 367, 378; impaired, 413; modality of, 218
visual ability, 193; monitoring, 206
visual attention, 193, 197–98, 201–2, 204, 206–7, 241, 277, 363
visual language, xxv, 11, 16, 193, 276, 278, 357–59, 379, 382, 384, 404, 436, 444, 452, 484
visually reliant tools, 271–72, 276
visual modality, 84, 123, 193; heightened abilities, 193
visual processing, 10, 50, 71, 73, 146, 149, 151–52, 193–94, 204, 206–7; memory, 137
visual studies, 252
visual-tactile, 234, 251; modality, 234; orientation, 234, 238–39, 247; way of being, 245, 251
"visual vernacular," 459
voice, 5–6, 20, 183, 187, 247–50; dual meaning of, 424; interpreter's, 248; limitations, 250; range, 250

Wilcox, Sherman, 81, 85, 87, 119, 121, 123
Williams, Cen, 107
Williamson, Aaron, xv, xxxix
windows, 242–43, 441
Wingfoot Clan, 314, 316–17
Witteborg, Jennifer Grinder, xxxvii
women's studies, 4
Woodward, James, 116, 296
World Federation of the Deaf, xvii, xxvii, 38, 42, 143, 330
World Health Organization (WHO), 49
World in Six Songs, The (Levitin), 437, 441

Yucatec Maya, 292

Zaurov, Mark, xxiii, xxxv
Zeitlin, Wladislav, xxix