

FIFTH
EDITION WITH
NEW COURSE DVD

LINGUISTICS

of American Sign Language

AN INTRODUCTION



CLAYTON VALLI, CEIL LUCAS, KRISTIN J. MULROONEY, & MIAKO N. P. RANKIN

LINGUISTICS OF
AMERICAN SIGN LANGUAGE

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An Introduction

Fifth Edition

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For William C. Stokoe
and for our students

“In 1960, when *Sign Language Structure* and *The Calculus of Structure* were published . . . they argued that paying attention to sign language could only interfere with the students’ proper education.”

William C. Stokoe
May 1988

“The language [ASL] I finally discovered when I was 14 years old made me understand what’s happening around me. For the first time, I understood what was happening and finally started to learn. Now my education brain is blossoming.”

Gallaudet undergraduate
November 1990

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Part 2: ASL Stories and Conversations

“Preservation of the Sign Language,” told by George Veditz (NAD President, 1913). Used by permission of the Gallaudet University Archives.

“Applause for Eyes to See,” told by Bernard Bragg. From *A Handful of Stories* (Washington, DC: Gallaudet University Press, 1981). Used by permission.

“Spelling?” told by May Curtis. From *A Handful of Stories* (Washington, DC: Gallaudet University Press, 1981). Used by permission.

“A Little Bit at a Time,” told by Mary Beth Miller. From *A Handful of Stories* (Washington, DC: Gallaudet University Press, 1981). Used by permission.

“The Snowmobile,” told by Val Dively. (Washington, DC: Gallaudet University Press, 1992).

Stories from *ASL PAH! Deaf Students’ Perspectives on their Language*, edited by Clayton Valli, Ceil Lucas, Esmé Farb, G. Paul Hulik (Burtonsville, MD: Sign Media Inc., 1992). Used by permission.

“House,” told by Brenda S. Mitchiner. From *ASL: Storytime*, vol. 3 (Washington, DC: Gallaudet University Department of Sign Communication, 1991).

“Brotherhood,” told by Mike Kemp. From *ASL: Storytime*, vol. 7 (Washington, DC: Gallaudet University Department of Sign Communication, 1991).

“Tobacco.” From the NSF Sociolinguistic Variation Project conducted at Gallaudet University, 1994–2001.

“Oklahoma City Bombing.” From the NSF Sociolinguistic Variation Project conducted at Gallaudet University, 1994–2001.

“Cards.” From the NSF Sociolinguistic Variation Project conducted at Gallaudet University, 1994–2001.

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“ASL in Class.” From the NSF Black ASL Project conducted at Gallaudet University, 2007–2011.

“Kansas Conversation.” From the NSF Sociolinguistic Variation Project conducted at Gallaudet University, 1994–2001.

“Louisiana Conversation.” From the NSF Sociolinguistic Variation Project conducted at Gallaudet University, 1994–2001.

“My Favorite Old Summer House,” signed by Clayton Valli, from Clayton Valli, *Poetry in Motion: Original Works in ASL* (Burtonsville, MD: Sign Media Inc., 1990). Used by permission.

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Under Playlists, click "Linguistics of American Sign Language (5th edition) DVD."

Preface to the Fifth Edition

In the years since the publication of the first edition of *Linguistics of American Sign Language*, we have been fortunate to have had the opportunity to communicate with teachers and students who have used this book. During that same time period, we have been using the text in our classes and workshops. The changes in this edition reflect both our experience and the comments received from users. It is also distinguished by the arrival of a fourth author, Miako Villanueva, an ASL linguist and interpreter with years of experience teaching the structure of ASL to Gallaudet undergraduates and workshop participants.

In this new, fifth edition, we set out to refine and clarify the existing text and, at the same time, make substantive changes that reflect the ever-expanding knowledge about ASL. Each part of the text has been revised, and a new part has been added just on syntax. Readers familiar with the previous edition will find some new supplementary readings as well as a whole new section on the DVD in which the signs and structures discussed in the text are demonstrated. It is our hope that these changes in the text and the accompanying DVD will provide students with a broader understanding of the linguistics of American Sign Language.



Many of our colleagues (both current and former) at Gallaudet University have reviewed the various editions of *Linguistics of American Sign Language*, and their valuable feedback has enabled us to continue to refine and expand the text. We gratefully acknowledge the contributions of Ben Bahan, MJ Bienvenu, Sandra Frankel, Randall Hogue, Robert E. Johnson, Barbara Kannapell, Arlene B. Kelly, Scott K. Liddell, Sue Mather, Melanie Metzger, Leslie Rach, Holly Roth, Paul Siegel, and Elizabeth Winston. We are also grateful to Sandy Brown of Catonsville Community College for allowing us to field-test the materials in the college's Interpreter Training Program, to Sam Supalla and Ted Supalla for reviewing early drafts of the manuscript, and to Christine Brown for the section on film and ASL in unit 26 of this edition.

Val Dively of the Department of Interpretation at Gallaudet University signed "Snowmobile Story," and Paul Filiatreault and Gary Brooks of Gallaudet University Video Services prepared the DVD that accompanies the book. Permission to use additional material on the DVD has been provided by Sign Media, Inc., Gallaudet University Archives, and Gallaudet University Press. We thank Ivey Wallace and Donna Thomas at Gallaudet University Press for their work in the production of the materials and for their continuing support of this book.

Finally, we owe a significant debt of gratitude to our students and the many workshop participants who have given us their feedback over the years—they have played a central role in the development of these materials.

Introduction

We developed *Linguistics of American Sign Language* in the early 1990s because of the lack of materials on American Sign Language (ASL) structure at the undergraduate level. In the years since then, as we have taught ASL structure to fluent users of the language, we have refined and revised the text. Yet, we still have the same two basic goals in writing this text.

Our first goal is to teach the basic concepts of linguistics as they pertain to ASL structure. To this end, we introduce fundamental areas of linguistic inquiry—phonology, morphology, syntax, semantics, and the use of language—and discuss the phonological, morphological, syntactic, semantic, and sociolinguistic structure of ASL. Our discussion reflects the current state of research in these areas, including the work of individual researchers. We recognize that there is more than one perspective on some aspects of ASL structure. We have chosen to work within the theoretical framework developed by our colleagues in the Department of Linguistics at Gallaudet University—Scott K. Liddell and Robert E. Johnson. We also recognize that perspectives on linguistic phenomena are often subject to rapid change, and our materials reflect some of the most significant changes in perspective. One of the most important concepts we want to convey is that linguistic inquiry is a dynamic and flexible undertaking, not a frozen or static one. In fact, since this book first appeared in 1992, perspectives on some aspects of sign language structure and its use have changed, and research in areas such as discourse and variation has increased dramatically.

Our second goal is to teach students to think critically about the structure of ASL and about claims that researchers make about that structure. We encourage students not to memorize linguistic facts but rather to think about language structure. This text is designed for undergraduate-level students who already know how to sign ASL and who have skills in using the language. For that reason, we set aside the time for class discussions, during which students can think about and question the information being taught. We encourage students to use what they already know to learn about the linguistics of ASL.

Linguistics of American Sign Language consists of seven parts. The first part introduces fundamental ideas about languages as unique communication systems. We use this section to focus attention on the fact that ASL is a language. No one can really understand the structure of ASL without first knowing its basic components. The second part, on phonology, provides an introduction to the basic parts of signs and lays the groundwork for the examination of morphology (part 3), syntax (part 4), and semantics (part 5). Part 6, Language in Use, deals with variation and historical change, discourse, bilingualism and language contact, and artistic uses of ASL, in other words, how signers *use* their language.

Part 7 consists of supplemental readings. The readings are of three types: “classics,” such as the articles by Battison and Stokoe, to provide historical background

for the study of sign language linguistics; articles that represent current research on ASL; and readings that provide a foundation in general linguistics. Many of the readings cover, in detail, concepts that are explained in the text.

In addition, a DVD accompanies the text. The first part of the DVD provides demonstrations of all of the signs and structures discussed in the text. The second part of the DVD contains a wide variety of signing examples, ranging from a 1913 film of George Veditz, a former president of the National Association of the Deaf, to interviews of Deaf subjects who have been part of large research projects on sociolinguistic variation. The DVD can be used by teachers and students for class discussion and homework assignments.

Because of our focus on the linguistic structure of ASL, we have not included information about Deaf culture or the Deaf community. We leave it up to individual instructors to include such information in their courses.

PART
ONE

INTRODUCTION

UNIT

Defining Language

WHAT IS A LANGUAGE?

Human beings communicate and share information through language. All languages, whether signed or spoken, are based on specific rules that the users of the language know and follow. Languages are *rule-governed communication systems*. The scientific study of language is called *linguistics* and the people who study language are called *linguists*. Linguists are interested in discovering and describing the rules that govern language. Without these rules, people would not have a useful communication system — in other words, they would not be able to communicate their thoughts and ideas to one another.

People and animals can communicate through different kinds of communication systems. Some of these systems also have rules. For example, Morse code, semaphore (the flag system used in the United States Navy), traffic signals, and symbols used in public places, as well as the communication systems used by bees, birds, dolphins, and nonhuman primates, all have specific rules that determine meaning. Both Morse code and semaphore use symbols to represent letters of the alphabet, numbers, and, in the case of Morse code, punctuation. In essence, these systems are “codes for codes,” or codes for a writing system. Language shares some features with these other communication systems, but it is distinguished by a number of other features. In the following section we will explore how language is similar to but different from other communication systems.

Features Shared by Language and Other Communication Systems

Systems Use Symbols. Language and other communication systems are composed of symbols that their users manipulate to produce meaning. Different kinds of symbol systems exist to facilitate linguistic communication. English has a writing system that uses symbols to represent sounds or combinations of sounds. For example, the written letter *a* is a symbol for one sound in the English word *cat*, and the combination of written letters is a symbol for an entity in the real world; *cat* is a symbol for a small mammal having a tail, whiskers, etc. The spoken English word is a symbol, part of a different symbolic system separate from the written system,



Figure 1. Symbolic representation of “cat.”

Note: This is one of several variants of the sign CAT.

though not unrelated to it. The American Sign Language (ASL) sign CAT is also a linguistic symbol (see Figure 1). (Small capital letters are used for the English word that corresponds to the ASL sign. This is called a *gloss* and will be discussed at length in part 2.)

Symbols Are Organized and Used Systematically. Languages are rule-governed systems, and it is the job of linguists to discover what the rules are and how the system works, a job that is not always easy. The rule-governed nature of ASL can be explained, in part, by examining the conditions on the formation of ASL signs. These conditions were first described by Robbin Battison (1978) as a result of his observations about the structure of ASL signs (see pp. 193–212). Battison proposed that sign formations were based on two conditions, which he called the Symmetry Condition and the Dominance Condition. The Symmetry Condition states that in a two-handed sign, if both hands move, then they will have the same handshape and type of movement. This is illustrated by the signs DRAMA and MAYBE. The Dominance Condition states that in a two-handed sign, if each hand has a different handshape, then only the active hand can move; the passive, or weak, hand serves as a base and does not move. (For right-handed signers, the right hand is the active or dominant hand, while the left hand is the passive or weak hand. The opposite is true for left-handed signers.) The Dominance Condition is illustrated by the signs WORD and MONEY.

When a two-handed sign has different handshapes, Battison reported that the passive hand tends to be one of seven basic handshapes—B, A, S, O, C, 1 (or G), or 5 (see Figure 2). From this information, it is clear that sign structure is not random. Signs can be grouped into different classes; for example, signs like DRAMA and MAYBE are systematically different from signs like WORD and MONEY.

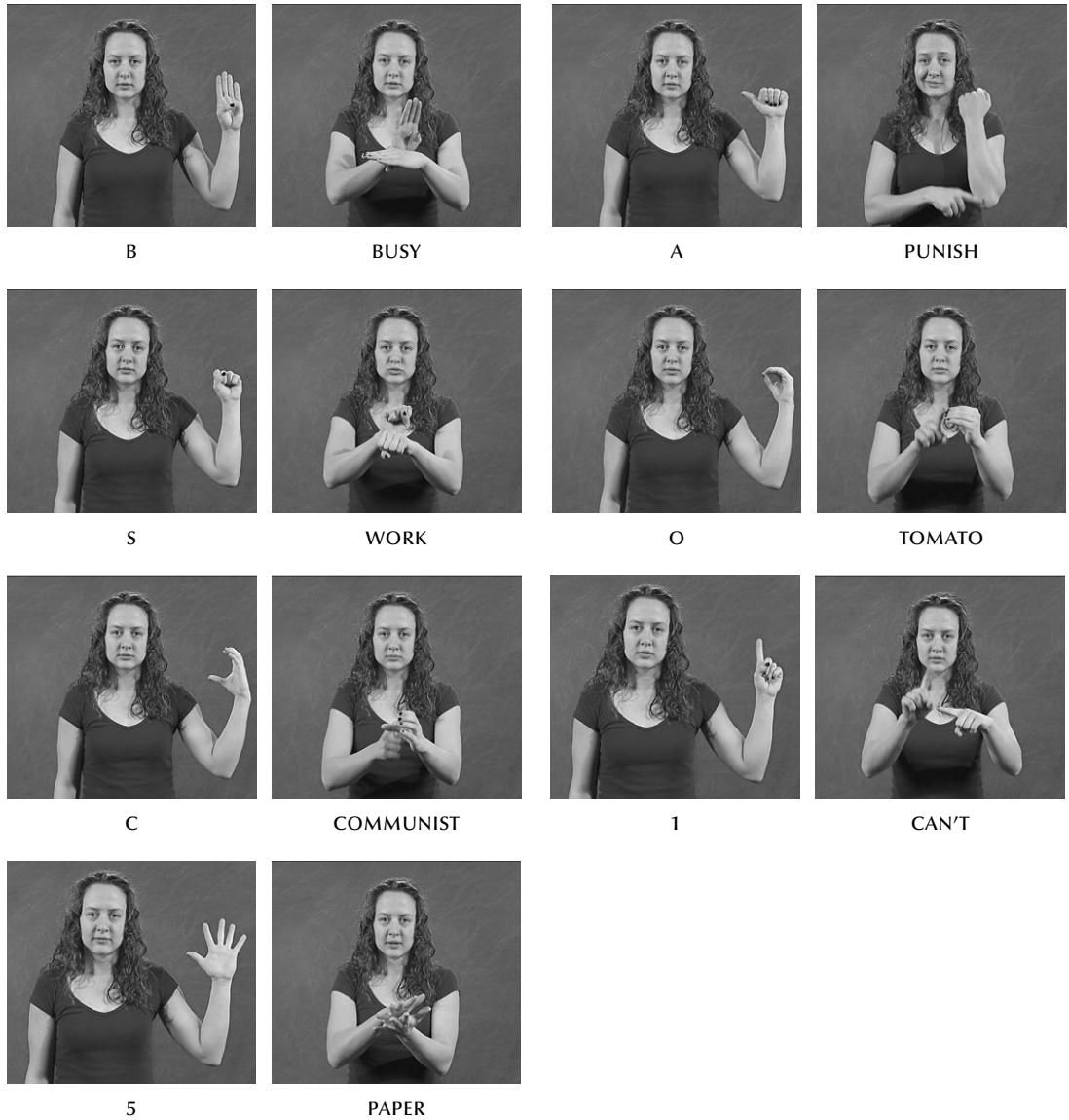


Figure 2. The seven basic handshapes of the passive/weak hand.

Several observations can be made at this point.

1. ASL users can think of many examples of signs in both classes.
2. If both hands move in signs like WORD and MONEY, the sign looks odd and seems to break the rules.
3. The movement in DRAMA and MAYBE is alternating, meaning that the hands move in exactly opposite ways (that is, when the right hand is up, the left hand is down; when the left hand moves up, the right hand moves down). If the movement is not alternating, the signs look funny and seem to break the rules.

Not all two-handed signs where both hands move require alternating movement; some use simultaneous movement, as seen by the signs CAN (be able to) and PLAY. The point is that the signs DRAMA and MAYBE clearly illustrate some underlying structure or rules. It is also important to begin to notice and describe sign structure—How many hands does the sign DRAMA have? Are the handshapes the same or different? Is the movement of the hands alternating or simultaneous? Skilled users of ASL and some native users may never have noticed or articulated the rules that govern the structure of signs.

Symbol Forms May Be Arbitrary or Iconic. When talking about the forms of a communication system, *arbitrary* means that the actual form of the symbol does not reflect the form of the thing or activity it symbolizes. *Iconic* means that the form of the symbol is an icon or representation of some aspect of the thing or activity being symbolized. Examples of “folk explanations” of the origin of signs based on iconicity include the sign GIRL, which is made on the chin to represent bonnet ribbons; and the sign MAN, which depicts the brim of a hat.

All languages, spoken and signed, have examples of arbitrary forms and iconic forms. Liddell (1990) pointed out that this is not an either-or issue. All languages have iconic and arbitrary symbols. This recognition is especially important for the study of sign language structure because until recently, although researchers recognized the iconicity in ASL signs, they did not seem to know how this fit in the overall description of ASL structure. Furthermore, linguists had a definite sense that admitting the existence of iconicity in sign languages was admitting that sign languages were not “real” languages, certainly not as real as spoken languages whose forms were supposedly arbitrary. It was as though the arbitrary nature of ASL signs had to be emphasized to prove that ASL is a real language and not just a collection of “pictures in the air.”

In many communication systems, the actual form of the symbols used may be arbitrary; that is, the fact that red traffic lights are red is of no importance. What is important is the constant relationship between the form, a red light, and its conventional meaning, stop. The actual *form* of the dance that bees do has no connection with the distance from the hive. Likewise, the actual number of dots and dashes in each Morse code signal or the actual design on a semaphore flag is arbitrary. What is important in each case is the relationship between the established form and the meaning. Likewise, in language, the actual forms that speakers or signers use may be arbitrary. We discussed the English word *cat*, which consists of three sounds, *k æ t*. The combination of those sounds and the resulting form is arbitrary; that is, the form of the linguistic symbol does not reflect the physical entity it symbolizes. Nothing about the word *cat* is reminiscent of an actual cat.

Not all words in spoken languages are completely arbitrary in their form. Linguists have described processes in spoken languages such as onomatopoeia and phonesthesia. Onomatopoeia in spoken languages occurs when the linguistic form of a word symbolizes the sound of the object or activity to which the form refers. For example, the sound that a rooster makes is called *cock-a-doodle-do* in English,

chi chi ri chi (*ch* is pronounced as *k*) in Italian, and *kokekokko* in Japanese. Another example in English would be *choo choo*, referring to a train.

Phonesthesia describes groups of words that resemble each other and whose form seems to reflect their meaning. For example, Bolinger (1975) pointed out that English words that end in *-ump*, such as *rump*, *dump*, *hump*, *mump*, *lump*, *bump*, seem to share a meaning of heaviness and bluntness. Likewise, words such as *twirl*, *whirl*, *furl*, and *gnarl* seem to share a meaning of twisting. One problem with the linguistic analysis of such words is that *-ump* and *-irl* or *-url* cannot be isolated and described as meaningful units in the way that meaningful units (or morphemes) are traditionally isolated and described. Nevertheless, part of the linguistic form of the word seems to symbolize some aspect of the thing or activity that it represents, and that is what iconicity means: The linguistic form is an icon or representation of some aspect of an entity or activity.

It would appear, then, that all spoken languages have iconicity. And clearly, sign languages have iconicity as well. While the form of many signs, such as *WRONG* or *LOUSY*, is arbitrary, the form of many other signs reflects some physical aspect of the entities or activities they represent.

Sarah Taub (2000) speculated that iconic forms are created in ASL when a mental image associated with an original concept is selected (for example, a typical tree for the sign *TREE*). This image is then *schematized* so that it can be represented in the language. In this process, the essential features are kept and the unnecessary ones are dropped—using the example of the sign *TREE*, it doesn't matter exactly how many branches an actual tree has or how thick the trunk is. This image is then *encoded*, using the appropriate aspects of ASL, such as the forearm and the 5 handshape. The result is an iconic symbol that is a part of the vocabulary of the sign language.

Images are schematized differently in different sign languages. This can be seen in the different signs for *STUDENT* in ASL, Italian Sign Language (LIS), and Thai Sign Language (see Figure 3). So, simply because the forms of some signs reflect some physical aspect of the entity or activity to which they refer (i.e., are iconic) does not mean that there are no arbitrary forms in ASL or that ASL is a collection of pictures in the air with no grammatical structure. For example, it is probably true that the form of the sign *SIT* is an iconic representation of human legs sitting. However, other sign languages have different ways of symbolizing this concept; the actual way of iconically symbolizing in sign language is language specific. That is, as long as some physical aspect is symbolized, it doesn't matter which of several symbolizable aspects is chosen, and different sign languages choose different aspects.

While the sign *SIT* may be iconic, focusing on its iconicity will not provide much insight into the interesting relationship between *SIT* and the noun *CHAIR*, and other noun-verb pairs like it. Nor will it help explain how the movement of the verb *SIT* can be modified to mean *SIT-FOR-A-LONG-TIME* (slow, circular movement) or *SIT-ABRUPTLY* (short, sharp movement). Finally, while the sign *SIT* may be iconic of human legs sitting, the sign for *CAT SIT* is made with two bent fingers, not four, even though most cats have four legs; the signs *CAT SIT* and *BIRD SIT* are made

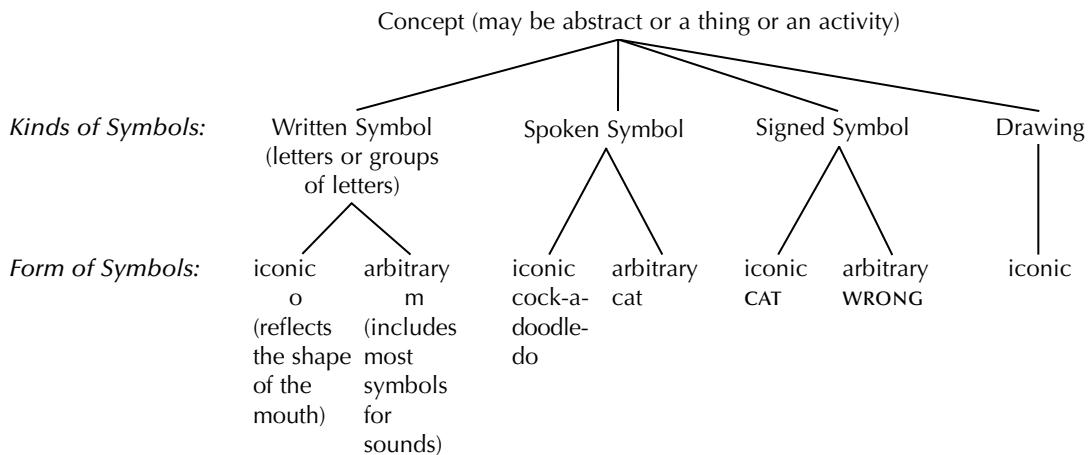


Figure 3. Signs for STUDENT in ASL, Italian Sign Language (LIS), and Thai Sign Language.

with the same two bent fingers, even though cats and birds have different kinds of legs. The point is that while signs may be iconic, iconicity does not mean a literal representation of the thing or activity. Signs are linguistic units; they are not pictures in the air. While the iconicity of signs is interesting and important, it is only one aspect of American Sign Language structure (see Figure 4).

Members of a Community Share the Same Communication System. Users of Morse code know how the system works; likewise, sailors who use semaphore share a knowledge of that system. Bees, dolphins, and birds share the rules of their respective communicative systems. And the same can be said for the users of communication systems that are known as languages. The concept of a community of users traditionally has been the source of debate in linguistics. Nevertheless, it is possible to define communities of users, often in terms of regional, ethnic, occupational, socioeconomic, or gender differences. That is, users of American Sign Language in one part of the country may have different signs from users in another part of the country; black signers may sign differently from white signers; particular occupational groups may have special signs for their work; although no research is yet available on this, it may be the case that middle-class, college-educated signers sign differently than working-class signers who completed high school; men and women may sign differently depending on the topic.

Many ASL signs have regional variants. Although this has not been studied extensively, there is evidence of its occurrence. It is not a question of a “wrong” sign or a “right” sign, but simply a question of different signs for the same concept.



Arbitrary: The form of the symbol *does not* reflect the characteristics of the concept, thing, or activity it symbolizes.

Iconic: The form of the symbol *does* reflect some characteristic of the concept, thing, or activity it symbolizes.

Note: The form of the symbol may be arbitrary or iconic; the form cannot be predicted; what can be predicted is the *constant* relationship between a symbol (arbitrary or iconic) and a concept to produce a meaning. It is possible to have symbols for other symbols. For example, CAT is the written symbol for the ASL signed symbol (see Figure 1).

Figure 4. Arbitrary and iconic symbols.

Features That Make Language Unique*

Language Is Productive; The Number of Sentences That Can Be Made Is Infinite; and New Messages on Any Topic Can Be Produced at Any Time. Some communication systems have limited productivity; that is, only a certain number of messages can be produced. Bees show limited productivity, while birds show none. Morse code and semaphore are codes for written language; therefore, they could produce an infinite number of messages, but this would be impractical. Both of these systems are designed for the rapid communication of a limited number of messages. However, the symbols and signals of human language can be combined in an endless number of ways. Part of the very nature of language is that the number of sentences is infinite; any thought can be encoded.

Language Has Ways of Showing the Relationship between Symbols. In other communication systems (e.g., Morse code, semaphore, and animal systems), the symbols occur sequentially, and the perceiver gets meaning from seeing or hearing the sequence of symbols. But other communication systems do not have ways of

*This discussion is based on the work of O'Grady, Archibald, Aronoff, and Rees-Miller (2005).

showing a relationship between symbols, while languages do. For example, in the English sentence *The boy sits on the couch*, the -s on the verb *sit* indicates that the subject of the verb is third person singular; that is, the -s shows a relationship between the verb and the subject noun. In the sentence *The boy drives carelessly*, the word that follows the verb is known as an adverb, and it describes the verb.

ASL also has ways of showing relationships between symbols. The verbs DRIVE and LOOK AT can be signed with the mouth in what is usually described as “mm,” with the lips slightly protruded. This facial expression is a nonmanual signal that can be translated into English as “regularly, unexceptionally.” This nonmanual signal is very different from “th,” with the lips pouted and the tongue visibly positioned between the teeth. This can be translated into English as “carelessly.” (See unit 16 in part 4 for further explanation of adverbs.)

Languages have grammatical signals that are used to show the relationship between symbols. English has a class of words called *prepositions* that are used to show the relationship between other words. In the sentence *The book is on the table*, the word *on* shows the relationship between the words *book* and *table*. ASL shows this relationship in a different way. The sentence could be translated as

t t
TABLE INDEX-right, BOOK depiction-for-BOOK-ON-TABLE

In ASL, the relationship between the table and the book is shown with the use of *depiction*, not with a preposition. The depiction in this sentence is used to show the book being placed on the table. The *t* on top of the signs TABLE and BOOK indicates topicalization; in other words, by raising the eyebrows and tilting the head slightly, the signer can indicate the topic of the sentence. ASL has a way of showing the relationship between symbols, a way that is different from English.

Language Has Mechanisms for Introducing New Symbols. The set of symbols used in other communication systems is limited and set. New symbols cannot be introduced during the course of use. However, one of the most interesting facts about language is that it permits the constant introduction of new symbols by a variety of avenues. Some signs, such as MICROWAVE and COMPUTER, are created for new inventions. Other signs are developed through the process of compounding; for example, HOME (EAT SLEEP) and BROTHER (BOY SAME) (see unit 11).

New signs are added to the language as a result of language contact. Many older American signs for countries are being replaced with the country’s own sign (see Figure 5). The Deaf Way conference, an international meeting held at Gallaudet University in July 1989, had the effect of introducing a number of new signs into ASL, such as the sign for CLUB (see Figure 6).

Language Can Be Used for an Unrestricted Number of Domains. The domains (topic areas) of other communication systems are generally restricted to essential survival or emergency management; this is not the case with a language. The communication systems that animals use are restricted to the domains of food, danger,



ITALY (ASL)



ITALY (LIS)

Figure 5. The ASL and Italian Sign Language signs for “Italy.”



CLUB (Deaf Way)

Figure 6. The Deaf Way sign for “club.”

and mating, while the domains of semaphore are restricted to navigational and emergency information. However, language can be used for any domain that humans need to express, from survival and emergencies to philosophy and art. Again, since semaphore and Morse code are codes for written language, it would be *possible* to discuss any topic, but highly impractical.

The Symbols Can Be Broken Down into Smaller Parts. In most other communication systems, each symbol is a discrete unit that does not seem to have internal structure that can be manipulated by its users. For example, there are different

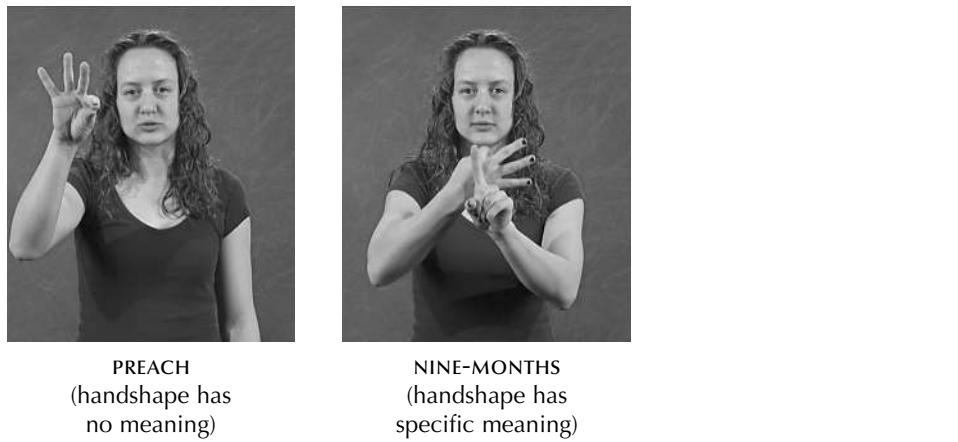


Figure 7. A comparison of signs in which handshape has no meaning and specific meaning.

types of bee dances, but the units that make up the dances cannot be recombined to make new dances; some research evidence shows the existence of smaller parts in birdsong and primate calls; the design on a semaphore flag is constant and discrete, as is the number of beeps in a Morse code signal. However, a fascinating fact about language is that the symbols of which it is composed can be broken down into smaller parts. In linguistics, this fact is called *duality of patterning*. In language, meaningless units are combined to form arbitrary symbols, and these symbols can in turn be recombined to create larger meaningful units. This point can be illustrated by comparing the signs Lousy, AWKWARD, and PREACH with the signs THREE-WEEKS, THREE-DOLLARS, and NINE-MONTHS. All six signs have internal structure: they each have a handshape, a location, a palm orientation, and movement. In ASL, the separate parts of some of the signs also have independent meaning. In the signs THREE-WEEKS, THREE-DOLLARS, and NINE-MONTHS, the handshape has specific meaning, such that the sign THREE-WEEKS is different from TWO-WEEKS, the sign THREE-DOLLARS is different from FIVE-DOLLARS, and NINE-MONTHS is different from SIX-MONTHS.

In other signs, all the parts together have one meaning. For example, in Lousy, AWKWARD, and PREACH, the handshape has no meaning; all of the parts of the sign function together as a unit (see Figure 7).

More than One Meaning Can Be Conveyed by a Symbol or a Group of Symbols. In other communication systems, each symbol or group of symbols has one meaning. These systems are incapable of expressing irony, sarcasm, humor, or indirectness. Not so with language. A single ASL sentence can function as a request for information, a command, or a statement. In any language, a single symbol or group of symbols may have different functions and, conversely, a single function may be realized by different symbols. For example, the simple question in ASL,



 y/n
 HOME PRO
Are you going home?

Figure 8. An example of raised eyebrows and head tilt with yes-no questions.

 y/n
 HOME PRO

meaning, “Are you going home?” can function either as a request for information or as a request for a ride home. [Note: the *y/n* above the line indicates a yes-no question, which entails raising the eyebrows and thrusting the head slightly forward (see Figure 8).] In linguistics, these differences have to do with *pragmatics*; that is, the meaning of a word or sentence depends upon aspects of the context in which it is used, such as time, place, relationship with the other person, and so forth. Related to this is the fact that we can also use language to lie or misrepresent a situation. While some birds do learn the calls of other bird species for the purposes of deception, it may be purely genetically determined behavior.

Language Can Refer to the Past, the Future, and Nonimmediate Situations; It Is Not Restricted to the Present and the Immediate. The feature of language that allows users to refer to different time periods is known as displacement. Other communication systems generally are restricted to present and immediate situations. It is true that the dance that bees perform may refer to a food source not in the immediate vicinity, but the reference is nonetheless to a fairly immediate entity. Birdsong shows no evidence of displacement. Language distinguishes itself by allowing references to events and entities not immediately present, and to past, future, and conditional events and entities. This concept is illustrated in the following ASL sentence:

YESTERDAY PRO TOLD-ME GO WILL PRO

Yesterday she told me she would go.

In this sentence, PRO refers to a person who is not immediately present; the sign YESTERDAY refers to an event that happened prior to this particular sentence. (The structure and function of what is written as PRO will be discussed in part 4.)

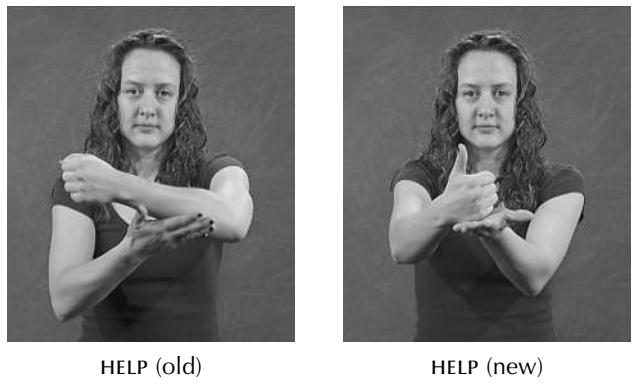


Figure 9. A comparison of old and new signs for “help.”

Language Changes Across Time. A major difference between language and other communication systems is that language changes across time as the result of use and interaction among users. While other communication systems may change, change must be consciously introduced and is not the result of natural interaction and use. This is not so with language. New words or signs are added to a language to reflect new technology (for example, the sign COMPUTER). Existing signs change over time. You can see this by comparing your signs for COW, WILL, TOMATO, and HELP with the older forms of these signs illustrated on the DVD (see Figure 9). What changes do you see?

Language Can Be Used Interchangeably. All users of a language can send and receive messages. This is not true, though, of other animal communication systems. Birdsong, for example, is done only by males, and bee dancing is done only by the foragers, the bees who hunt for food.

Language Users Monitor Their Use. As people produce language, they listen to or watch themselves, and they also correct themselves if they think the production is faulty. If an ASL signer produces the wrong sign, he or she may erase the air or sign NO-I-MEAN and start over. Researchers don’t know if birds and bees monitor their messages or not.

Parts of the System Must Be Learned from Other Users. A lot of research evidence indicates that humans are born with an innate capacity to learn and use language. Children must interact with adults and with other children to completely learn their language. Researchers think that this may be important for bee dancing and birdsong, but probably only to a limited extent.

Language Users Can Learn Other Variants of the Same Language. Clearly, users of ASL from New York can learn and use California signs that may differ from New

York signs. And users of ASL can learn and use foreign sign languages. Research shows that this is simply not the case with bees, birds, and nonhuman primates—they seem to be restricted to using one variant.

Language Users Use the Language to Discuss the Language. Users of language write dictionaries, grammar books, and linguistics textbooks. They reflect upon their language, they think about it, and discuss it. This feature seems to be unique to the human species.

WHAT IS ASL? WHY IS ASL A LANGUAGE?

American Sign Language is a natural language used by members of the North American Deaf community. It is a language that has developed naturally over time among a community of users. ASL exhibits all of the features of language discussed in this section.

Not much is known about the deaf people who lived in North America before 1817, but some probably came from Great Britain or Europe and some were probably born here. Deaf people who came from other countries probably brought their sign languages with them, and other communities of deaf people living in America probably developed their own language. Because there was little contact between different communities, several kinds of sign language probably were used in America before 1817.

In 1817, Thomas Hopkins Gallaudet and Laurent Clerc established the Connecticut Asylum for the Education and Instruction of Deaf and Dumb Persons—now called the American School for the Deaf—in Hartford, Connecticut. Gallaudet had met Clerc when he travelled to Europe in search of a method for educating Alice Cogswell, the deaf daughter of his neighbor, Dr. Mason Cogswell (Lane, 1984). He had first gone to Great Britain to learn about the oral method used by the Braidwood Schools in Scotland and near London, but the directors of these schools refused to share their methods.

While in London, Gallaudet met a Frenchman by the name of Sicard, who was the director of the Royal Institution for the Deaf in Paris. Sicard was in London with two of his deaf students, Jean Massieu and Laurent Clerc, demonstrating the success of his teaching methods. The method used at the Royal Institution involved the use of French Sign Language along with a set of signs invented to represent parts of written and spoken French not found in French Sign Language. These so-called methodical signs were originally developed by Abbé de l'Epée, the founder and first director of the school in Paris. Sicard invited Gallaudet to the Royal Institution to learn French Sign Language and their teaching method. Gallaudet accepted Sicard's offer and spent several months in Paris. When he returned to the United States, he was accompanied by Laurent Clerc. Clerc came to the United States to help establish a school for deaf children in Connecticut. On the trip to the U.S., Clerc taught Gallaudet French Sign Language, and Gallaudet taught Clerc English.

Many deaf people and some hearing people came to Hartford to learn the method being used at the newly established school. Some of the deaf students who came to Hartford brought their own sign language with them, including those from Martha's Vineyard. They also learned the sign language being used at the school, which no doubt included some French signs. As students graduated, some became teachers in other schools, thus spreading sign language to states across the country.

ASL is very different from systems such as Seeing Essential English (SEE 1), Signing Exact English (SEE 2), or Linguistics of Visual English (LOVE) that were developed to represent English on the hands for use in deaf education. (These systems are also commonly known as Manually Coded English, or MCE.) ASL and other sign languages are also very distinct from the gestures found in many spoken languages. As David McNeill (1992) explained, and as we will see as we explore the structure of ASL, one of the basic principles of languages is that parts combine to create larger wholes. In ASL, handshape, movement, and other grammatical features combine to form signs and sentences. In spoken languages, smaller gestures do not combine to form larger gestures, and gestures usually only occur while a person is speaking. In addition, units of language have standards of form (that is, a word or a sign is consistently produced the same way and that way is recognized by the community that uses it). Gestures do not have such standards of form. Each gesture is created at the moment of speaking and is not controlled by the structure of a linguistic system. ASL is such an autonomous linguistic system and it is independent of English. It has all of the features that make a language a unique communication system. ASL is a language.

SUPPLEMENTAL READINGS

"Analyzing Signs," by Robbin Battison (1978); pp. 205–224

Files 1.1, 1.2, 1.3, and 1.4 from *Language Files: Materials for an Introduction to Language and Linguistics* (2004); pp. 225–241

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Unit 2

Defining Linguistics

As we said in unit 1, the scientific study of language is called *linguistics* and the people who study language are called *linguists*. Linguists are interested in discovering and describing the rules that govern language. The field of linguistics has many subfields (see chart on p. 16), and while linguists are united in the goal of describing linguistic features, individually they focus on different aspects of the language they are studying. For example, some linguists focus on developing a theory about how the structure of the language is put together. Others are interested in the relationship between language structure and social structure and about the effect of different situations and contexts on language use. Some are interested in applying what they know about the structure of the language to teaching language, training interpreters, and other practical applications. And still others are interested in how the brain processes language and in how children learn language. As you can see, there are many approaches to the study of language structure and language use. We draw upon some of the various approaches in this book as we present the structure and use of ASL.

People who use language, be it signed or spoken, intuitively know their language and how it works, and this is valid knowledge. People's "gut feelings" about their language are very important. But linguists want to know about the structure of language by studying it in the same systematic way that chemists, biologists, physicists, medical researchers, and others study the natural world and the human body. This systematic approach is called the *scientific method*. It is based on gathering observable, empirical, and measurable evidence to prove or disprove hypotheses about what is being studied. If the data or evidence show that a hypothesis is false or not accurate, the hypothesis should be changed. The data should never be forced to fit the hypothesis. Linguists use the scientific method to study and understand the structure and use of sign languages. It is very easy to make claims about how sign languages are structured and used, but these claims need to be tested.

The following example demonstrates how the scientific method is applied to the study of sign languages. Suppose someone observes that younger signers produce signs like KNOW and FOR at a lower location more often than do older signers.

The Major Subfields of Linguistics

Listed below are some of the major subfields of linguistics and the aspect of language with which each is especially concerned.

Anthropological Linguistics: the study of the inter-relationship between language and culture (particularly in the context of non-Western cultures and societies).

Applied Linguistics: the application of the methods and results of linguistics to such areas as language teaching; national language policies; lexicography; translation; and language in politics, advertising, classrooms, courts, and the like.

Historical Linguistics: the study of how languages change through time; the relationships of languages to each other.

Morphology: the study of the way in which words are constructed out of smaller meaningful units.

Neurolinguistics: the study of the brain and how it functions in the production, perception and acquisition of language.

Phonetics: the study of speech sounds; how they are articulated (articulatory phonetics); their physical properties (acoustic phonetics); how they are perceived (auditory/perceptual phonetics).

Phonology: the study of the sound system of language; how the particular sounds used in each language form an integrated system for encoding information and how such systems differ from one language to another.

Pragmatics: how the meaning conveyed by a word or sentence depends on aspects of the context in which it is used (such as time, place, social relationship between speaker and hearer, and speaker's assumptions about the hearer's beliefs).

Psycholinguistics: the study of the interrelationship of language and cognitive structures; the acquisition of language.

Semantics: the study of meaning; how words and sentences are related to the (real or imaginary) objects they refer to and the situations they describe.

Sociolinguistics: the study of the interrelationship of language and social structure; linguistic variation; attitudes toward language.

Syntax: the study of the way in which sentences are constructed; how sentences are related to each other.

Note: Reprinted by permission of the publisher, from M. Crabtree and J. Powers, compilers, *Language Files: Materials for an Introduction to Language* (1991):5. Columbus: Ohio State University Press.

Based on this observation, a hypothesis can be formed that younger signers produce signs lower than do older signers, which is an indication that, over time, signs are generally being produced in a lower space. To test this hypothesis, we can videotape a number of older and younger signers. Before the actual taping begins, we need to consider whether our participants sign differently to each other when alone than with a researcher present, whether Black signers sign differently from White signers, whether men sign differently from women, and so forth. We count and analyze the examples of signs like KNOW and FOR that are produced at the forehead or that are lowered and see how they are distributed in terms of age, to see if we can confirm our hypotheses. This approach—forming hypotheses, collecting empirical data, analyzing the data, confirming or reworking the hypotheses—is widely used in the study of sign linguistics and parallels how investigations are conducted in other sciences.

It is important to note that the different subfields of linguistics approach the same data in different ways. The example above describes a sociolinguistic approach. Other approaches focus on different aspects; a semantic approach will look at the meaning of the signs while a syntactic one will look at how the signs function in sentences. A major goal in many of these approaches is to determine the rules of the language. Rules can mean different things. Linguists distinguish between *descriptive* rules—the rules that show us how a linguistic system works—and *prescriptive* rules—the rules that are found in grammar books and are associated with how speakers think a language should be structured. For example, *ain't* is a word that occurs in many varieties of English, as in *He ain't coming*, or *Tom ain't done nothing*. Prescriptive rules state that this is not “proper” English and should not be used. However, *ain't* is used every day, and linguists are interested in how it is used and in which situations. Similarly, people may not like the fact that some signers produce KNOW and FOR at a lower level, but linguists are interested in describing the linguistic rule that explains lowering.

PART
TWO

PHONOLOGY

UNIT 3

Signs Have Parts

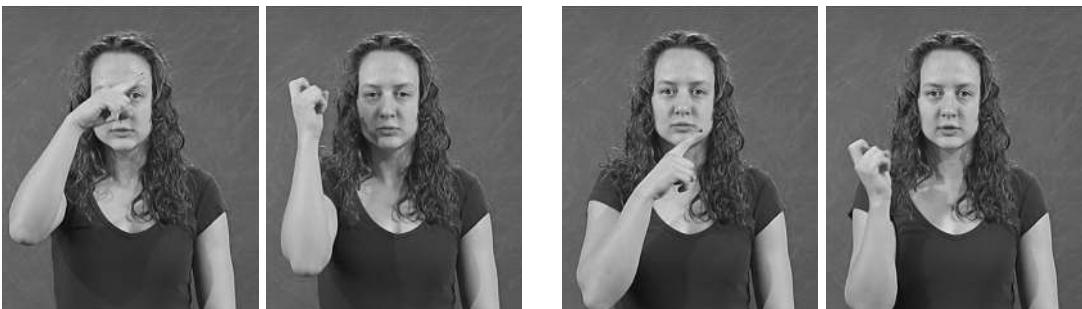
We know that one of the features that make language unique is that the symbols that make up language can be broken down into smaller parts. *Phonology* is the study of the smallest contrastive units of language. For spoken languages, those contrastive units are sounds, and linguists study how the sounds in a language are structured and organized.

TOOLS FOR ANALYZING ASL

Identifying the Parts of Signs

Sign language linguists use the term *phonology* to refer to the study of how signs are structured and organized. ASL signs have five basic parts—handshape, movement, location, orientation, and nonmanual signals (facial expression). These basic parts are also known as parameters. Signs can share one or more of the same parameters. For example, the sign FEEL has the same handshape as the sign SICK, the same movement as the sign HAPPY, and the same location as the sign COMPLAIN. SUMMER and DRY differ in location, RED and CUTE in handshape, SHORT and TRAIN in palm orientation, and SIT and CHAIR in movement. However, these pairs share three parameters: SUMMER and DRY share handshape, movement, and orientation; RED and CUTE share movement, orientation, and location; SHORT and TRAIN share handshape, location, and movement; and SIT and CHAIR share location, handshape, and orientation (see Figure 10). It is the difference in one parameter that is responsible for the difference in meaning.

We know that signs have parts, and we must identify those parts in order to know the meaning of a sign. We know from signs like SUMMER and DRY that location must be an important part because SUMMER and DRY have different meanings, yet the only difference between the two signs is the location. Likewise, we know from signs like SIT and CHAIR that movement must be an important part because the only difference in the form of the two signs is the movement. The same is true of handshape for RED and CUTE and orientation for SHORT and TRAIN. The basic questions to be answered when analyzing pairs of signs are How do you know that pairs of



SUMMER

Location

DRY



RED

Handshape

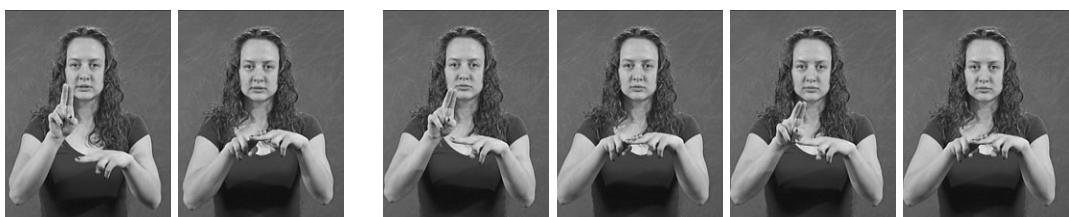
CUTE



SOON

TRAIN

Orientation



SIT

CHAIR

Movement

Figure 10. Pairs of signs that differ in only one parameter.

signs have different meanings? and What part of the sign is responsible for the difference in meaning?

Nonmanual signals are the fifth basic part of signs. Many signs in ASL require a nonmanual signal in order to be produced correctly. Nonmanual signals are the facial expressions that accompany certain signs. For example, the sign NOT-YET is usually made with the mouth open and the tongue slightly out; the sign FINISH is made with the lips protruded. Without these nonmanual signals, the signs are not correct. As we will see, nonmanual signals are important at all levels of the language: for individual signs (lexical level), for building new signs and for making sentences (morphological and syntactic levels), and in the use of language by signers (discourse level).

When analyzing the distinct parts of signs, it is helpful to remember the following three points:

1. Make sure that the parts are indeed the same and not just similar. For example, the handshape of RESPONSIBILITY is a Bent B, the same as the handshape in COMPARE, but only similar to the handshape in BOOK.
2. Sometimes two English words are represented by the same sign. For example, SHOULD may sometimes be glossed as NEED, but the form of the sign is identical. The movement may differ depending on the meaning.
3. There are items that look like ASL signs in that they have handshape, movement, location, and orientation, but neither their meaning nor their function is ASL. For example, the sign BECAUSE has the same movement as FORGET or the same location as SUMMER, but BECAUSE is not an ASL sign. It is the result of codes invented to represent English manually.

TOOLS FOR WRITING ASL

Linguists have different tools that they can use for writing ASL. One of these tools is *notation*, which allows linguists to write down signs and the nonmanual signals that accompany them. This can be done through two methods—*glossing* and *transcription*. The other tool is *translation*, which is the conversion of a message from one language into the grammatical form of another language.

Notation Methods

Glossing. A *gloss* is an English word that represents a sign. Linguists use glossing to write a signed utterance. Glossing is not the same as translating, but, like translating, it is sometimes a difficult task. A gloss of a signed story will be a series of English words, written in small capital letters, that correspond to the signs in the ASL story. Parts of English, such as plural markers, past-tense markers, and prepositions, do not appear in glossing unless they are produced in the specific story. The nonmanual features are indicated on a line above the sign glosses. Some basic conventions used for glossing are as follows:

1. Signs are represented with small capital letters in English; for example, CAT, HOUSE, STUDENT.

2. Lexicalized fingerspelled words are written in small capital letters and preceded by the # symbol; for example, #DO.
3. Full fingerspelling is represented by dashes between small capital letters; for example, M-A-R-Y.
4. Nonmanual signals and eye gaze can be represented on a line above the sign glosses or by placing the nonmanual signal after angle brackets around the part of the sentence that co-occurs with the nonmanual signal. For example, the English sentence *I love linguistics* can be glossed as follows:

^t
LINGUISTICS, PRO-1 KISS-FIST or <LINGUISTICS>^t PRO-1 KISS-FIST

In this example, the line above the gloss and the brackets represent nonmanual signals. The *t* over the line and after the brackets represents topicalization, which is marked by raised eyebrows (topicalization and other nonmanual signals will be explained in unit 15). Both ways of representing nonmanual signals will be used in this textbook.

Transcription. In addition to glossing signs into English, linguists have seen the need to devise a system for describing the structure of signs. We will discuss two systems that have been developed for describing the handshapes, locations, and movements of signs—the Stokoe system and the Liddell and Johnson system. These systems will be explained in later units; however, as an introduction to the concept of transcription, it is important to know the following three points:

1. In order for linguists to transcribe the structure of signs, they need to agree on the symbols used for describing the signs. These agreed-upon symbols are known as *conventions*, and they provide linguists with a consistent and predictable tool for transcription.
2. It is important that the transcription labels used be as precise as possible. The particular label for a handshape, a movement, or a location, and the arrangement of the labels in a particular way reveal something about the structure of signs.
3. The system chosen for labelling the parts of signs is a direct reflection of the researcher's perspective on the structure of signs. Transcription conventions do not exist in a vacuum, independent of linguistic theory. This point will be returned to in detail in discussion of the Stokoe system and the Liddell and Johnson system.

Translation

Translation is the representation of a message in one language into another language. Written messages in Italian can be translated into written English, for example. Messages signed in ASL can also be translated into written English. However, unlike glossing, translations do not include the nonmanual markers and other structural features that are represented in glosses.

On the DVD, you will find a story called “The Snowmobile.” The gloss of the first sentence in this story is PRO-1 ONE STORY NEVER FORGET (PRO-1 is the first-person pronoun, “I”). This glossing provides an English word for every sign in the order the signs are produced (see Figure 11). You can see that even though these



Figure 11. An example of a glossed sentence.

are English words, this is not an acceptable English sentence, but it helps us see what the signs are. Each one of these signs can be analyzed for its handshape, location, and other characteristics with specially devised symbols, or notations, which we will see in the discussion of the Stokoe and Liddell and Johnson systems. Finally, we can translate this ASL sentence to an acceptable English sentence: “There’s one story I will never forget.” All three of the writing tools are helpful for studying sign language structure.

SUPPLEMENTAL READING

“Signs Have Parts: A Simple Idea,” by Robbin Battison (1980); pp. 242–253

Homework Assignment 1

- 1.** For each sign listed below, find another sign that has the same parameters for handshape, movement, and location.

| Example: FEEL | <u>Same Handshape</u> | <u>Same Movement</u> | <u>Same Location</u> |
|--------------------------|-----------------------|----------------------|----------------------|
| | SICK | HAPPY | PRO-1, poss "my" |
| a. RESPONSIBILITY | | | |
| b. FORGET | | | |
| c. CUTE | | | |
| d. ENJOY | | | |
| e. BICYCLE | | | |
| f. UGLY | | | |
| g. BEST | | | |
| h. WORSE | | | |
| i. MONKEY | | | |
| j. DISCUSS | | | |

- 2.** What is the difference between the signs in each pair?

- a. SUMMER/DRY**
- b. RED/CUTE**
- c. SHORT/TRAIN**
- d. SIT/CHAIR**

- 3.** What does each pair of signs have in common?

- a. SUMMER/DRY**
- b. RED/CUTE**
- c. SHORT/TRAIN**
- d. SIT/CHAIR**

- 4.** List four signs that must have a nonmanual signal with them.

- 5.** Look at "The Snowmobile" on the DVD. Gloss the first 90 seconds of the story. The first part is glossed here as an example.

t head nod, eye blink
 PRO-1 ONE STORY NEVER FORGET. HAPPEN PRO-1 ABOUT OLD TWELVE.
 PRO-1. poss FAMILY HAVE TWO HOUSE. ONE HOUSE NORTH #MICH THAT-AREA,
 MOTHER-FATHER HOUSE, AUNT UNCLE HOUSE HOUSES-IN-A-ROW.

Homework Assignment 2

1. Suppose you are the first linguist to describe ASL signs and you have to describe the handshape in each of the following signs. Pick a name for each handshape.

| | | |
|---------------|-------------|-----------------|
| Example: SHOE | S handshape | |
| a. GIRL | g. LECTURE | m. MOTHER |
| b. ELEVATOR | h. PREACH | n. ALWAYS |
| c. SPAGHETTI | i. PEOPLE | o. PLATE (dish) |
| d. AWKWARD | j. GIVE | p. LOBSTER |
| e. TRAVEL | k. MATH | q. SHOULD |
| f. PLAY | l. PITY | r. MARRY |

2. Pick a name for the location (place where the sign is made) of each of the following signs.

| | | |
|---------------|--------------|---------------------|
| Example: KNOW | face | |
| a. PLAY | e. FACE | i. STRICT |
| b. NOT | f. YESTERDAY | j. BROKE (no money) |
| c. FEEL | g. HOSPITAL | k. PUNISH |
| d. DOCTOR | h. TIME | l. DUTY |

3. Pick a name for the movement in each of the signs listed below.

| | | | |
|---------------|--------------------------------|-------------|----------------|
| Example: HELP | upward | | |
| a. OPPRESS | f. MAYBE | k. TRAVEL | o. DIVIDE |
| b. BUSY | g. SELL | l. COMMUTE | p. DIE |
| c. KEY, LOCK | h. YES | m. CLEAR | q. FASCINATING |
| d. BOIL | i. COFFEE | n. APPROACH | r. CONTACT |
| e. RELATED | j. MISS (didn't see something) | | |

4. Using the labels you have picked for handshape, location, and movement, describe the following signs.

| | | |
|-------------|---------------|---------|
| a. CHILDREN | c. TRAIN | e. DEAF |
| b. PLAY | d. UNDERSTAND | f. GIVE |

UNIT 4

The Stokoe System

In unit 3, we saw that ASL signs have internal structure; that is, that they can be broken down into smaller parts. Those parts include handshape, location, movement, palm orientation, and nonmanual signals. In this unit, we examine the first system devised for the formal description of signs. Homework Assignment 2 introduced you to labelling systems. In the first section, you described the handshape for each sign; in the second and third sections you described the location and the movement of signs. You have probably discovered that there may be different solutions to the same problem. For example, the handshape of PREACH can be described as a 9 or as an F; there are different signs for LOBSTER; both BUSY and COMMUTE can be described as having a back-and-forth movement.

The realization that emerges from the homework assignment is that there is a need for consistency and uniformity in a descriptive system. Arguments can be made for choosing either 9 or F as the label for the handshape in PREACH, but once a choice of label has been made, it must be used consistently. In addition to consistency, there is a need for precision, so that if the movement in both BUSY and COMMUTE can be described as *back and forth*, some way must be created to uniquely describe the movement in each sign. The movement in some signs, such as APPROACH or DIVIDE, may be difficult to describe, making the need for precision in descriptions even more important.

THE STOKOE SYSTEM

William C. Stokoe devised the first system for describing signs. Before Stokoe, signs were thought of as unanalyzable wholes, with no internal structure. Stokoe was the first to suggest that signs could be analyzed in the same way that the units of spoken language can be analyzed. In 1960, Stokoe proposed that signs have three parts (parameters) that combine simultaneously. The three parts are the location of the sign, which he called the *tabula* or *tab*; the handshape, which he called the *designator* or *dez*; and the movement, which he called the *signation* or *sig*. Palm orientation and nonmanual signals were dealt with indirectly in the Stokoe system.

Stokoe referred to the three parameters as *cheremes*, from the Greek word *cheir*, for hand. He saw cheremes as meaningless elements that combine to form all signs, in the same way that phonemes combine to form words in spoken languages. Each parameter has a set of members known as primes. For example, handshape primes include A, B, and 5; location primes include face, nose, and trunk; movement primes include upward movement, downward movement, and movement away from the signer. Figures 12 and 13 show the symbols used for writing the signs of ASL, as they appear in *The Dictionary of American Sign Language* (1965) by William C. Stokoe, Dorothy C. Casterline, and Carl G. Croneberg. In Stokoe's system, cheremes were written down in a specific order—TD^S. That is, the location of the sign (tab) was written first, followed by the handshape (dez), and then the movement (sig). For example, the sign IDEA is written as follows:

○| ^

○ indicates the forehead location, | represents the handshape, and ^ represents the upward movement. Another example is the sign for “I” or “me.” The midchest location is indicated by []. The handshape is represented by G, x represents contact, and _T represents movement toward the signer. All together, it looks like this:

[]G_T^x

tab dez sig

Stokoe's system allows for some variations on the basic TD^S representation of signs. Signs with two hands are represented as TDD^S (for example, WITH ØA'A^x, where the x indicates the two hands contacting each other); signs with one movement and then another are shown as TD^{SS} (for example, MILLION BaB^{x_Lx}, where x_Lx represents the repeated contact on the palm of the weak hand).

In the Stokoe notation system, the weak hand is regarded as the location for the sign, as shown in the following example (see Figure 14).

COOK B_aB_b^{xax}

PICK-ON G_AX^{Vx}

The signs PRO-1.poss (“my”), PRO-1 (“I, me”), and THINK are similar but show some contrasts. Here is how they look in the Stokoe system (see Figure 15):

PRO-1.poss PRO-1 THINK

[]B_T^x []G_T^x ○G_T^x

Tab symbols

1. Ø zero, the neutral place where the hands move, in contrast with all places below
2. ☐ face or whole head
3. ☑ forehead or brow, upper face
4. ☒ mid-face, the eye and nose region
5. ☓ chin, lower face
6. ☔ cheek, temple, ear, side-face
7. ☕ neck
8. [] trunk, body from shoulders to hips
9. ☖ upper arm
10. ☗ elbow, forearm
11. ☘ wrist, arm in supinated position (on its back)
12. ☙ wrist, arm in pronated position (face down)

Dez symbols, some also used as tab

13. ☚ compact hand, fist; may be like 'a', 's', or 't' of manual alphabet
14. ☛ flat hand
15. ☜ spread hand; fingers and thumb spread like '5' of manual numeration
16. ☝ curved hand; may be like 'c' or more open
17. ☞ contracted hand; like 'e' or more claw-like
18. ☝ "three-ring" hand; from spread hand, thumb and index finger touch or cross
19. ☚ index hand; like 'g' or sometimes like 'd'; index finger points from fist
20. ☚ index and second finger, side by side, extended
21. ☚ "pinkie" hand; little finger extended from compact hand
22. ☚ like G except that thumb touches middle phalanx of second finger; like 'k' and 'p' of manual alphabet
23. ☚ angle hand; thumb, index finger in right angle, other fingers usually bent into palm
24. ☜ "cock" hand; thumb and first two fingers spread, like '3' of manual numeration
25. ☚ tapered hand; fingers curved and squeezed together over thumb; may be like 'o' of manual alphabet

26. ☚ "warding off" hand; second finger crossed over index finger, like 'r' of manual alphabet
27. ☚ "victory" hand; index and second fingers extended and spread apart
28. ☚ three-finger hand; thumb and little finger touch, others extended spread
29. ☚ hook hand; index finger bent in hook from fist, thumb tip may touch fingertip
30. ☚ "horns" hand; thumb and little finger spread out extended from fist; or index finger and little finger extended, parallel
31. ☚ (alloheric variant of Y); second finger bent in from spread hand, thumb may touch fingertip

Sig symbols

- | | | | |
|-------|--|---|-------------------|
| 32. ^ | upward movement | } | vertical action |
| 33. v | downward movement | | |
| 34. n | up-and-down movement | | |
| 35. > | rightward movement | } | sideways action |
| 36. < | leftward movement | | |
| 37. z | side to side movement | | |
| 38. t | movement toward signer | } | horizontal action |
| 39. + | movement away from signer | | |
| 40. x | to-and-fro movement | | |
| 41. a | supinating rotation (palm up) | } | rotary action |
| 42. d | pronating rotation (palm down) | | |
| 43. w | twisting movement | | |
| 44. b | nodding or bending action | } | interaction |
| 45. ☚ | opening action (final dez configuration shown in brackets) | | |
| 46. # | closing action (final dez configuration shown in brackets) | | |
| 47. x | wiggling action of fingers | } | |
| 48. o | circular action | | |
| 49. x | convergent action, approach | | |
| 50. x | contactual action, touch | | |
| 51. x | linking action, grasp | | |
| 52. + | crossing action | | |
| 53. o | entering action | | |
| 54. + | divergent action, separate | | |
| 55. " | interchanging action | | |

Figure 12. Stokoe's symbols for writing the signs of American Sign Language.

Note: Reprinted by permission of the publisher, from W. C. Stokoe, D. C. Casterline, and C. G. Croneberg, *A Dictionary of American Sign Language* (rev.). (1976): x–xii, Silver Spring, MD: Linstok Press.

$\cup R^x \quad \underline{\quad} \quad x>x$

(initial dez; tips of dez fingers touch lips or chin) N *restaurant*. In some localities sign may be used for 'doughnut'.

$\cup R_\perp^x$

(imit.; knuckles of dez touch tab so that fingers project outward)

N *cigar*.

$\cup V_T @$

\vee *read lips*; N *speech reading, lipreading, oralist*; \times *oral*. May also be extended 'speech' and 'the organs of speech'.

See also $\Pi V_{T_x}^\wedge$.

$\cup V_{\perp 1} @$

(imit.: fangs; may also be made in high zero-tab with or without left G-hand touching dez elbow) N *snake, serpent*. See also synonym: $B_o \sqrt{G_1^@}$.

$\cup V^x \cdot$

(initial dez; index fingertip of dez touches chin) N *vinegar*.

$\cup V_{\# T}^{x\wedge}$

(imit.; dez touches chin, moves up and snaps open to full V with or without touching forehead) N *goat*. In some regions used for 'cheese'. 'Goat' is also signed $\cup A^x 5^w$.

$\cup W^x \cdot \quad \underline{\quad}^z$

(initial dez) N *water*.

This sign serves as first element in several compounds:

$\underline{\quad} \quad \# \emptyset C_o C_o^V \cdot$ 'rain'

$\underline{\quad} \quad \# \emptyset 5_{o\circ} 5_{o\perp}^x$ 'river'

$\underline{\quad} \quad \# \emptyset B B_\perp^z$ 'stream'

$\underline{\quad} \quad \# \emptyset \sqrt{5_{o\circ}} \sqrt{5_{o\perp}}^N$ 'ocean'

$\underline{\quad} \quad \# V_o V_o^x \# \emptyset \sqrt{5_{o\circ}} \sqrt{5_{o\perp}}^N$ 'salt sea'

All these are imitative of the flowing, meandering, or undulating nature of the referent. However, these signs are seldom used except for such uses as signing a poem when nonce compounds too are acceptable, e.g. 'water' plus 'quiet' for 'pond'.

Usually signers spell the names of lakes, beaches, rivers, and oceans. On the east coast a-c 'Atlantic City' and o-c 'Ocean City'.

Figure 13. Examples of Stokoe's transcription system.

Note: Reprinted by permission of the publisher, from W. C. Stokoe, D. C. Casterline, and C. G. Croneberg, *A Dictionary of American Sign Language* (rev.). (1976): 168, Silver Spring, MD: Linstok Press.



Figure 14. Weak hand as location.



Figure 15. Sign contrasts.

SUPPLEMENTAL READING

"Introduction," to *A Dictionary of American Sign Language*, by William C. Stokoe (1965; 1976); pp. 254–269

Homework Assignment 3

- 1.** Using the Stokoe symbols for movement, location, and handshape, transcribe the following signs:

- | | |
|----------------------------|--------------------------|
| a. ENJOY | e. SUNDAY |
| b. BEGIN | f. EVERY SATURDAY |
| c. BROKE (NO MONEY) | g. KNOW |
| d. BUSY | h. NOT |

UNIT 5

The Concept of Sequentiality in the Description of Signs

In unit 4, we discussed the transcription system devised by William Stokoe for describing ASL signs. Stokoe's work clearly represents the beginning of linguistic analysis of sign language structure. In this unit, we will focus on two issues relating to sign language structure that emerge from Stokoe's system—the level of detail needed to describe ASL signs, and the representation of sequence in ASL signs.

DETAIL IN THE DESCRIPTION OF ASL SIGNS

According to Stokoe's system, the location for the signs HEAVEN, SIGN, and CHILDREN is described as \emptyset , or “the neutral place where the hands move,” in contrast with other specific locations on the body such as nose, neck, or arm. Similarly, the handshape for GIVE, NUMBER, and NOTHING is described as O . In the case of the location, the description \emptyset does not show that the signs HEAVEN, SIGN, and CHILDREN are in fact produced at distinctly different levels (see Figure 16). To produce the sign HEAVEN at the level at which SIGN is produced would be unusual; likewise, to produce the sign CHILDREN at the level at which HEAVEN is produced would be unusual. The description of the location for each sign needs to be more specific. The description \emptyset is not specific enough. And while the handshape of GIVE and NUMBER may look the same, the handshape for NOTHING is quite distinct. The description of O for the handshape of these three signs is not specific enough (see Figure 17).

THE REPRESENTATION OF SEQUENCE IN ASL SIGNS

Some ASL signs have only one handshape, one movement, one location, one palm orientation, or one nonmanual signal. For example, the sign MOTHER has only one handshape; the sign UNDERSTAND has one location; the sign COLOR has one handshape and one location; and the sign MAYBE has one palm orientation. However, many ASL signs have more than one handshape, location, palm orientation, or



Figure 16. Signs that are described in Stokoe's system as having the same location.



Figure 17. Signs that have the same handshape, according to Stokoe's system.

nonmanual signal. That is, many ASL signs have a sequence of handshapes, locations, palm orientations, or nonmanual signals (see Figure 18). Examples of such sequences are as follows:

| | | |
|--------------------|----------------|--------------------------------------|
| handshape: | UNDERSTAND | $X \rightarrow 1$ |
| location: | DEAF | ear \rightarrow chin |
| palm orientation: | DIE (1-handed) | palm down \rightarrow palm up |
| nonmanual signals: | FINALLY | closed lips \rightarrow mouth open |

In the Stokoe system, a sequence of two movements is shown in the movement part of the transcription. The sign MILLION would be written as follows:

MILLION $Ba\tilde{B}\dot{x}^\perp\dot{x}$

This notation means that the Bent B handshape of the active hand (\tilde{B}) contacts the weak hand (palm up, Ba) once in a sharp movement (\dot{x}) and then moves away from the signer ($^\perp$) and repeats the contacting movement (\dot{x}). The sequence of movements, then, is represented as $\dot{x}^\perp\dot{x}$. In the Stokoe system, when there is a sequence

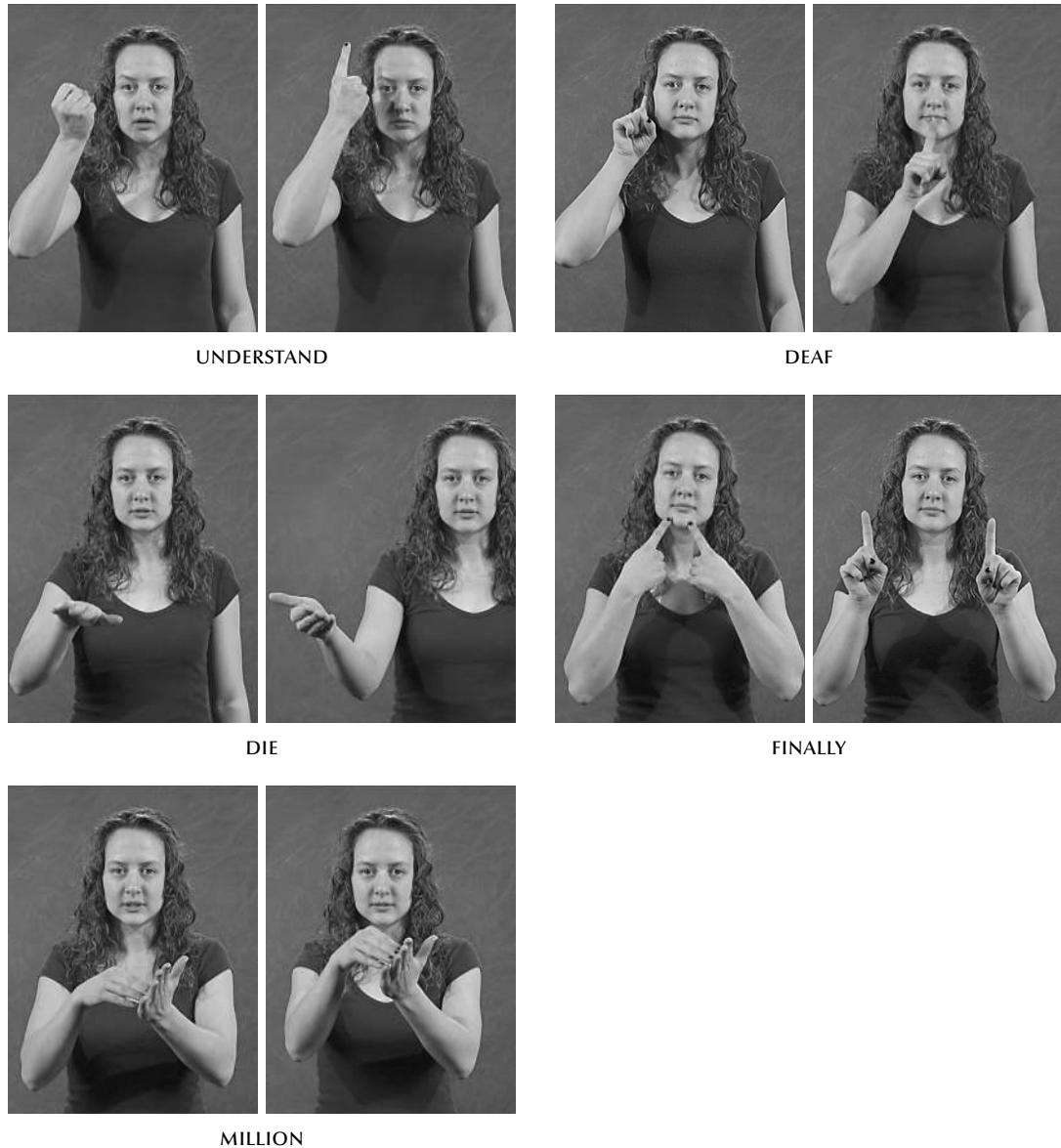


Figure 18. Example of sequence in ASL signs.

of handshapes, orientations, or locations, the change is shown in the movement portion. For example, UNDERSTAND has two handshapes, **X** and **G** (in the Stokoe system), and the second handshape is shown with the movement

$\cap_X \tau \square [G]$

This notation means that the handshape **X** is oriented toward the signer (τ) at the forehead (\cap) and that there is an opening action (\square) that results in the handshape **G**.

The sequence of orientation in the sign DIE is shown in the movement

$\emptyset \text{Bd}^a$

This notation means that the hand begins with the palm down (**Bd**). In the course of producing the sign, the orientation of the hand changes so that **d** becomes **a**.

In one variant of the sign DEAF, the **G** handshape moves upward (^), contacts the chin (x) and then moves up and back and contacts the cheek. The sign is represented as follows:

$\cup \text{G} \wedge x^T x$

So the sequence of locations is shown by $x^T x$.

MINIMAL PAIRS

It is not that the Stokoe system ignores sequences of handshapes, locations, and orientations. These sequences are seen as a function of the movement component. It is essential to understand that in Stokoe's system these sequences are seen as secondary to the description of signs. What this means is that he proposed a structure for sign language that is different from the structure of spoken language at its most basic level. To clarify this point, we must examine one of the most basic concepts in the phonology of any language, that is, the concept of contrast.

In English, we are able to isolate and describe the basic parts of English phonology (*phonemes*) because of word pairs that are called minimal pairs. An example of a minimal pair are the words *pat* and *bat*. These words are contrastive in meaning (that is, they mean different things), and they are identical in all segments (parts that occur in sequence) except one. Furthermore, the two segments that contrast, *p* and *b*, differ in only one feature: *b* is produced with vibration of the vocal cords and is called a voiced sound, while *p* has no vibration and is voiceless. The following diagram analyzes the segments of the minimal pair *pat* and *bat* (α is the symbol used to represent the vowel):

| | <i>p</i> | α | <i>t</i> | <i>b</i> | α | <i>t</i> |
|-------------------------|-----------|----------|-----------|----------|----------|-----------|
| place of articulation: | bilabial | | alveolar | bilabial | | alveolar |
| manner of articulation: | stop | | stop | stop | | stop |
| voiced or voiceless: | voiceless | | voiceless | voiced | | voiceless |

The features that are listed under each sound are referred to as a bundle of articulatory features, and *p* and *b* differ in only one of these features—voicing. We know that *p* and *b* must be contrastive phonemes in English (that is, they must be among the basic building blocks of the language) because two sequences of sounds that are otherwise identical have different meanings, and that difference in meaning must be linked to the difference between *p* and *b*. The kind of contrast demonstrated by *pat* and *bat* is called sequential contrast.

Sequential contrast is different from simultaneous contrast (that is, distinctions of one feature within a single, co-occurrent bundle of features). As we just saw, the contrast between the English sounds *p* and *b* (when these sounds are not in a

sequence of sounds) is an example of simultaneous contrast. Both *p* and *b* consist of co-occurrent features, and they differ only in one of those features, namely, voicing. Similarly, in the Stokoe view of signs as simultaneously produced parameters, there are many pairs of signs that are in contrast. For example, in the Stokoe system, the following pairs of signs are considered minimal pairs.

| | | |
|--------|-------|-----------------------|
| SUMMER | DRY | contrast in location |
| SIT | CHAIR | contrast in movement |
| RED | SWEET | contrast in handshape |

In all of the pairs, the signs differ in only one of the co-occurrent parts.

In the Stokoe system, contrast is seen as simultaneous contrast, and the issue of sequential contrast is not discussed. However, there are examples of sequential contrast in ASL, and because these examples exist, a system for describing ASL structure must be able to describe and account for any sign in the language. An example of sequential contrast in ASL can be seen in the pair of signs CHRIST and CONGRESS. CONGRESS is produced with a sequence of locations on the upper chest; this form of CHRIST is produced almost exactly like CONGRESS, except that its final location is the lower torso. The contrast between the two signs lies in the difference in one feature, the final location. Similarly, in the one-handed version of the sign CHILDREN, the palm orientation is down, while in the one-handed version of DIE, the palm is down and then up. The contrast between the two signs is in the sequence of orientation, down-down as opposed to down-up.

The Dictionary of American Sign Language (DASL) describes the location of the sign GIVE as \emptyset , the neutral location for signs without body contact. However, the contrast between the signs FIRST-PERSON-GIVE-TO-THIRD-PERSON and THIRD-PERSON-GIVE-TO-FIRST-PERSON is precisely in the location, and both of those signs show a sequence of locations.

It is very important to understand that many signs have sequences of handshapes, locations, orientations, or nonmanual signals but that the sequence is not contrastive. For example, some signs show a sequence of nonmanual signals, as with the sign ADMIT, which first has the lips pursed as the palm contacts the chest, and then the mouth opens as the hand moves away from the chest. A similar sequence occurs in one version of the sign FINALLY as the hands change orientation (see Figure 19). Without these nonmanual signals, the signs are not properly produced, and the sequence within the nonmanual signal cannot be reversed. It is not possible to begin with an open mouth and end with closed lips. It would seem then that sequence in nonmanual signals is very important.

Many signs have a sequence of locations; that is, first one and then the other. For example, the sign DEAF begins just below the ear and ends on the chin. However, it can begin the other way around, on the chin, and end just below the ear. This is an example of variation in ASL, variation that occurs for stylistic or regional or grammatical reasons. What is important is that the variation lies in the sequence of locations. Since the sign means the same thing whether it begins at the ear or the chin, it is not an example of contrast, but the sequence of locations still is important in understanding the structure of ASL and how it can vary.



Figure 19. Two versions of FINALLY.

It is important to remember that sign languages show sequential contrast in the same way that spoken languages do, and it is very important for the system used to describe the sign language to represent that fact.

SUMMARY

The following list summarizes some of the problems with the Stokoe transcription system.

1. Detail in the description of ASL signs. For example,

| <i>Location</i> | |
|------------------|---|
| HEAVEN | Ø |
| SIGN | Ø |
| CHILDREN | Ø |
| <i>Handshape</i> | |
| GIVE | O |
| NUMBER | O |
| NOTHING | O |

2. The representation of sequence in ASL signs.

a. MILLION BaBx^{↓x} Movement repeated, sequence of movement.

b. CONGRESS and CHRIST both have a sequence of location, and the only difference between them is the final location. However, in the Stokoe system, this sequence of location is not shown. They are transcribed as follows:

CONGRESS [JC^{x>x}

CHRIST [JCV_x[>]

The same location is given for both, [], which means “trunk, body from shoulders to hips.”

c. DIE B_dBq_d

The two-handed sign has two orientations in sequence (R: palm up→down; L: down→ up), and that is shown in the movement. However, signs like one-handed DIE and one-handed CHILDREN, which each have a sequence of orientations and seem to differ only in orientation, are not distinguished as such in the Stokoe system.

d. DEAF $\cup G \wedge^{XTX}$

The sign has two locations in sequence (chin→cheek), and that is shown in the movement. This sign also can be made from cheek→chin. The Stokoe system does not show this.

e. GIVE $\emptyset O_1 O_1^q$

The specific location of the hand provides information about who is the subject and who is the object of the verb. The Stokoe system does not include this information.

f. ADMIT and FINALLY are among the many signs that include a nonmanual signal.

The parts of the nonmanual signal must be produced in sequence. However, in the Stokoe system, no mention is made of the nonmanual signal, much less of the fact that the parts of the signal must occur in sequence.

SUPPLEMENTAL READING

Files 3.1, 3.2, 4.1, 4.2, and 4.3 from *Language Files: Materials for an Introduction to Language and Linguistics* (2004); pp. 270–291

UNIT 6

The Liddell and Johnson Movement–Hold Model

In unit 5, we examined ways in which the transcription system devised by Stokoe cannot adequately describe the structures of signs, specifically in the areas of level of detail and sequentiality. In units 6 and 7, we will very briefly describe a system developed by Scott K. Liddell and Robert E. Johnson. We will refer to this system as the Movement–Hold Model. Though details of the model are numerous and complex, its basic claims about sign language structure are important. The basic claims reflect a perspective about the structure of signs that significantly differs from Stokoe’s perspective, and it is important to understand that difference in perspective.

The basic claim about the structure of signs in the Movement–Hold Model is that signs consist of hold segments and movement segments that are produced sequentially. Information about the handshape, location, orientation, and nonmanual signals is represented in bundles of articulatory features. These bundles of articulatory features are similar to the ones we described in unit 5 for the sounds of spoken languages. Holds are defined as periods of time during which all aspects of the articulation bundle are in a steady state; movements are defined as periods of time during which some aspect of the articulation is in transition. More than one parameter can change at once. A sign may only have a change of handshape or location, but it may have a change of both handshape and location, and these changes take place during the movement segment. For example, in the sign UNDERSTAND, only the handshape changes; in the sign FALSE, only the location changes; however, in the sign FASCINATING, both the handshape and the location change, while the sign is moving.

Liddell and Johnson developed a transcription system in order to record the movement (M) and hold (H) segments of each sign. As their model developed, they began to notice differences in the length of hold segments in some signs. For example, they observed that the initial hold segment in the sign THINK was shorter than the final hold. To accommodate this difference they introduced the “X”

segment to capture the fact that the length of some holds could be altered without changing the meaning of the sign.

The transcription system uses the term *strong hand* to describe the active hand and the term *weak hand* to describe the hand acted upon. Right-handed signers more often than not use their right hand as their strong hand while left-handed signers use their left hand. Sometimes, however, signers switch their hand dominance, but the Liddell and Johnson transcription system allows for this to be noted. The examples that follow demonstrate how the transcription system works.

The first example is a simplified Movement–Hold transcription schema for the sign WEEK. In this schema, the production of the sign is broken down into specific units, and different aspects of the sign are noted. The timing unit describes each segment; in other words, whether it is a movement, a hold, or a shortened hold. Contour allows a specific movement shape to be described (for example, straight vs. curved). If contact occurs during a segment, a plus sign (+) is inserted in the chart. The schema also allows linguists to record the hand configuration used in the sign (handshape), the focal site where the hand is placed (placement/location), the direction the palm faces in relation to the body (rotation/orientation) and any nonmanual signals that accompany the sign.

| WEEK | | | | | |
|----------------|------------------------|------------|---------------------------|-------------------------|---|
| | | | Unit 1 | Unit 2 | Unit 3 |
| Timing Unit | | | X | M | H |
| Contour | | | | | |
| Contact | | | + | + | + |
| Local Movement | | | | | |
| Strong Hand | Handshape | focal site | 1 | | 1 |
| | Placement (Location) | | Base of palm of weak hand | Fingertips of weak hand | Fingertips of weak hand Palm facing down |
| | Rotation (Orientation) | | Palm facing down | Palm facing down | |
| | Nonmanual signal | | | | |
| Weak Hand | Handshape | focal site | B | | B |
| | Placement (Location) | | In front of torso | In front of torso | In front of torso Palm facing upward |
| | Rotation (Orientation) | | Palm facing upward | Palm facing upward | |
| | Nonmanual signal | | — | — | |

The sign WEEK begins with the shorter hold (X), with the strong hand at the base of the palm of the weak hand. The strong hand then moves (M) to the fingertips of the weak hand and ends with a full hold (H) in that location. The only change in this sign is in the location of the strong hand, from the base of the palm to the fingertips of the weak hand.

The one-handed sign GUESS is notated as follows:

| GUESS | | | | | |
|----------------|---|------------|---|---|---------------------|
| | | | Unit 1 | Unit 2 | Unit 3 |
| Timing Unit | | | X | M | H |
| Contour | | | | | |
| Contact | | | | | |
| Local Movement | | | | | |
| Strong Hand | Handshape Placement (Location) Rotation (Orientation) Nonmanual signal | focal site | C Ipsi nose Palm facing upward — | S Contra nose Palm facing downward — | articulatory bundle |

This sign begins with a shortened hold (X) on the strong side (also referred to as ipsilateral or ipsi) of the nose at about eye level. It moves to the weak side (also referred to as contralateral or contra) and ends in a hold near the weak side cheek. The sign begins with a C handshape and ends with an S handshape. The palm orientation begins with the palm facing slightly upward and ends with the palm facing downward.

Not all signs have a hold-movement-hold (X M H) structure (see Table 1). While there are at least nine possible sign structures, H M is not among them (see Figure 20). As you can see, not all combinations are acceptable in ASL structure.

Table 1. Possible Sign Structures

| Structure | Sign |
|---|---------------------------|
| Hold (H) | COLOR, STARE |
| X M H, unidirectional ^a | ME, THINK |
| H M H, unidirectional | GOOD, UNDERSTAND |
| X M X or H M H, oscillating movements ^b osc osc | LIGHT-YELLOW or DREAM |
| X M X M X M H, simple reduplicated, ^c unidirectional | SCHOOL, AIRPLANE |
| X M X M X M H, 3 movements, not reduplicated | DEAF, RESTAURANT |
| X M X M X M X M X M X, 3 focal sites, ^d 5 movements | GOAT, CHINA (new version) |
| X M X M H or H M X M H, 2 movements, not reduplicated | SODA-POP, DESTROY |
| X M X M X M X M X M X M X, repeated bidirectional movement ^e | MAYBE, INTERPRET |

^a *Unidirectional* signs are produced in a single direction. For example, GOOD moves in one direction away from the signer.

^b *Oscillating* movement means that the movement is contained within the hand itself and does not involve a change of location.

^c *Reduplicated* movement occurs when a sign begins in one location, ends in another location, and then the entire sequence is repeated.

^d *Focal sites* indicate where signs are produced. The focal site of THINK is on the forehead. A sign can have more than one focal site. The international sign for CHINA has three—the weak side shoulder, the strong side shoulder, and the strong side near the hip.

^e *Bidirectional* signs move in two directions. In the sign MAYBE, the hands alternate moving up and down.



Figure 20. Examples of possible sign structures. (Remember to view the demonstrations on the DVD.)

As you can see in Table 1, the structure of GOOD is H M H while the structure of THINK is X M H. This is because the initial hold of GOOD is longer than the initial hold of THINK. Though the details of the Liddell and Johnson Movement–Hold transcription system are beyond the scope of this course, it is important to understand four basic components of the system.

1. The Liddell and Johnson system makes the claim that the basic units of signs—movements and holds—are produced sequentially. The information about handshape, location, orientation, and nonmanual signals is represented in bundles of articulatory features found in each unit. This claim is very different from Stokoe's assertion that the parameters of signs are produced simultaneously, but it parallels theories of the segmental structure of spoken languages. Liddell and Johnson claim sign languages and spoken languages are the same in their basic structure, adding support to arguments that sign languages are legitimate and viable languages. Sign languages are not unlike spoken languages, as Stokoe said. They are like them in the most basic way.
2. The Liddell and Johnson system solves the descriptive problems presented by the Stokoe system. It clearly shows that sequence is very important and contrastive in some signs, and it allows sequences to be described efficiently.
3. The Liddell and Johnson system provides adequate detail for the description of signs. Stokoe clustered the A, T, and S hand configurations into one handshape, despite their possible contrastive use. Stokoe counted 19 handshape primes, while Liddell and Johnson counted more than 150. This level of detail allows the system to document any sign language. In addition, the location and orientation features have explicit descriptions that make distinctions Stokoe's system does not. For instance, the signs CONGRESS and CHRIST differ in the final location (ipsi shoulder for CONGRESS, ipsi lower stomach for CHRIST). Stokoe's system describes both locations as on the torso.
4. The Liddell and Johnson system describes thumb configurations separately from finger configurations. This is a contrastive feature of some signs, such as LATER and TWENTY. What sets this notation system apart is its ability to provide a clear and precise way to describe the differences in any sign.

SUPPLEMENTAL READING

“American Sign Language: The Phonological Base,” by Scott K. Liddell and Robert E. Johnson (1989); pp. 292–331

REFERENCES

- Liddell, S. K., and Johnson, R. E. 1989. American Sign Language: The phonological base. *Sign Language Studies* 64:195–277.
- Johnson, R. E., and Liddell, S. K. 2004. Aspects of American Sign Language phonology. Department of Linguistics, Gallaudet University. Typescript.
- . 2011a. A segmental framework for representing signs phonetically. *Sign Language Studies* 11: 408–463.
- . 2011b. Toward a phonetic representation of signs, I: Sequentiality and contrast. *Sign Language Studies* 11: 241–274.

Homework Assignment 4

- 1.** Identify the segments in the following signs.

Example: WEEK X M H

| | | | |
|-----------|----------------|---------------------|----------|
| a. FALSE | f. SIT | k. HELP | p. BRING |
| b. ALWAYS | g. CHAIR | l. BROKE (no money) | q. WRITE |
| c. EAT | h. CAN'T | m. PREACH | r. KING |
| d. COLOR | i. INTERESTING | n. WEAK | s. WHERE |
| e. PAPER | j. GOOD | o. ARRIVE | t. BLACK |

- 2.** Transcribe the following five signs using the Liddell and Johnson model and the Stokoe system. Compare your transcriptions. If possible, consult the *Dictionary of American Sign Language* directly for Stokoe's transcription of these signs.

Example: WEEK

Stokoe: B_a G_{b>}

Liddell and Johnson

WEEK

| | | | Unit 1 | Unit 2 | Unit 3 |
|----------------|---|------------|--|--------|---|
| Timing Unit | | | X | M | H |
| Contour | | | | | |
| Contact | | | + | + | + |
| Local Movement | | | | | |
| Strong Hand | Handshape Placement (Location) Rotation (Orientation) Nonmanual signal | focal site | 1 Base of palm of weak hand Palm facing down | | 1 Fingertips of weak hand Palm facing down |
| Weak Hand | Handshape Placement (Location) Rotation (Orientation) Nonmanual signal | focal site | B In front of torso Palm facing upward — | | B In front of torso Palm facing upward — |

- a. UNDERSTAND
- b. BLACK
- c. DEAF
- d. SIT
- e. CHAIR

UNIT

7

Phonological Processes

Now that we have talked about the parts of signs and how they are organized, we can talk about ways in which sign structure may vary. The parts of signs may occur in different orders, and the parts of signs may influence each other. These variations are due to phonological processes (that is, the ways in which the parts of signs interact with each other). In this unit, we discuss five of them: movement epenthesis, hold reduction, metathesis, assimilation, and weak hand deletion.*

MOVEMENT EPENTHESIS

Signs occur in sequence, which means that the segments that make up signs occur in sequence. Sometimes a movement segment is added between the last segment of one sign and the first segment of the next sign. This process of adding a movement segment is called *movement epenthesis*. It is illustrated in the sequence of signs FATHER STUDY (see Figure 21). The basic form of both signs is a hold with internal movement, as follows:

| | |
|--------------|-------|
| FATHER | STUDY |
| (right hand) | |
| H | H |

When the two signs occur in sequence, a movement is inserted between the two holds, so that the sequence looks like this:

| | | |
|--------|-------|---|
| FATHER | STUDY | |
| H | M | H |

We will return to movement epenthesis when we discuss fingerspelling.

* This discussion is based on the work of Liddell and Johnson (1989) and Lucas et al. (2001).

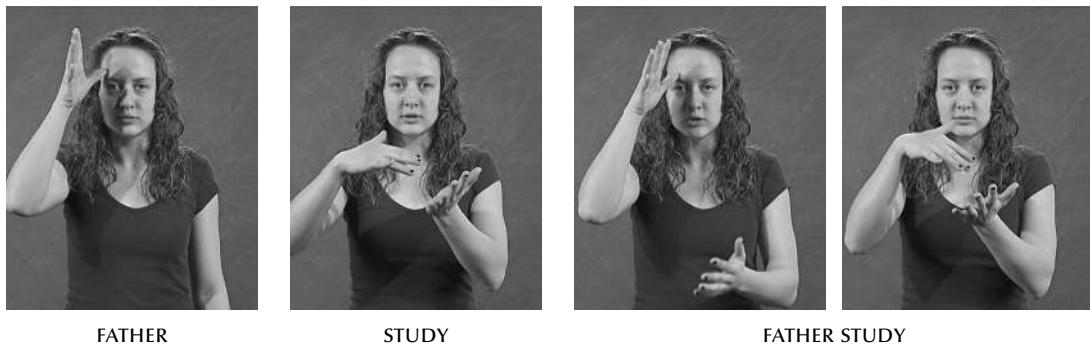


Figure 21. An example of movement epenthesis.

HOLD REDUCTION

Movement epenthesis is related to another phonological process called *hold reduction*. Hold reduction shortens holds between movements when signs occur in sequence. For example, the sign GOOD is composed of a hold, a movement, and a hold. The sign IDEA is composed of a shortened hold (X), a movement, and a hold. When the two signs occur in sequence, the last hold of GOOD and the first hold of IDEA become shortened holds (see Figure 22). The whole process would look as follows:

| Basic sign: | GOOD | | | IDEA | | |
|----------------------|------|---|---|------|---|---|
| | H | M | H | X | M | H |
| Movement epenthesis: | H | M | H | M | X | M |
| Hold reduction: | H | M | X | M | X | M |

This is a fairly common process in ASL, and we will return to it when we talk about compounds.

METATHESIS

Sometimes parts of the segments of a sign can change places. This process of changing place is called *metathesis*. To illustrate metathesis, look at the basic structure of the sign DEAF:

| DEAF | | | | | | | |
|-------------|-----------|---|----------|---|----------|---|----------|
| | X | M | X | M | X | M | H |
| Handshape | 1 | | 1 | | 1 | | 1 |
| Location | ant cheek | | at cheek | | ant jaw | | at jaw |
| Orientation | palm out | | palm out | | palm out | | palm out |

Note: The abbreviation *ant* means "just in front of."

However, the location feature of the first and last segment might be reversed (see Figure 23). In that case, DEAF would look like this:

| | DEAF | | | | | | |
|-------------|----------|---|----------|---|-----------|---|----------|
| | X | M | X | M | X | M | H |
| Handshape | 1 | | 1 | | 1 | | 1 |
| Location | ant jaw | | at jaw | | ant cheek | | at cheek |
| Orientation | palm out | | palm out | | palm out | | palm out |

Many signs allow segments to change place, including CONGRESS, FLOWER, RESTAURANT, HONEYMOON, NAVY, TWINS, BACHELOR, PARENTS, HOME, and HEAD. Other signs do not allow the location feature of segments to change place, such as BODY,



Figure 22. An example of hold reduction.



Figure 23. An example of metathesis.



BROTHER dv:GET-OFF-SNOWMOBILE PRO-1 dv:GET-OFF-SNOWMOBILE

Figure 24. An example of assimilation.

KING, CHRIST, INDIAN, BLOUSE, THANKSGIVING, CHILDREN, and THING. In unit 23 we will talk about variation and what motivates signs like DEAF to exhibit variation.

ASSIMILATION

Assimilation means that a segment takes on the characteristics of another segment near it, usually the one just before it or after it. A good example of this is the handshape in the sign PRO-1 (1st person, "I"). The basic handshape is a 1, but when the sign occurs in a sequence, very often the handshape changes to match the handshape of another sign in the sequence. For example, in Figure 24, when the signer produces the sequence BROTHER dv:GET-OFF-SNOWMOBILE PRO-1 dv:GET-OFF-SNOWMOBILE, the handshape of PRO-1 changes from 1 to Bent V because of the

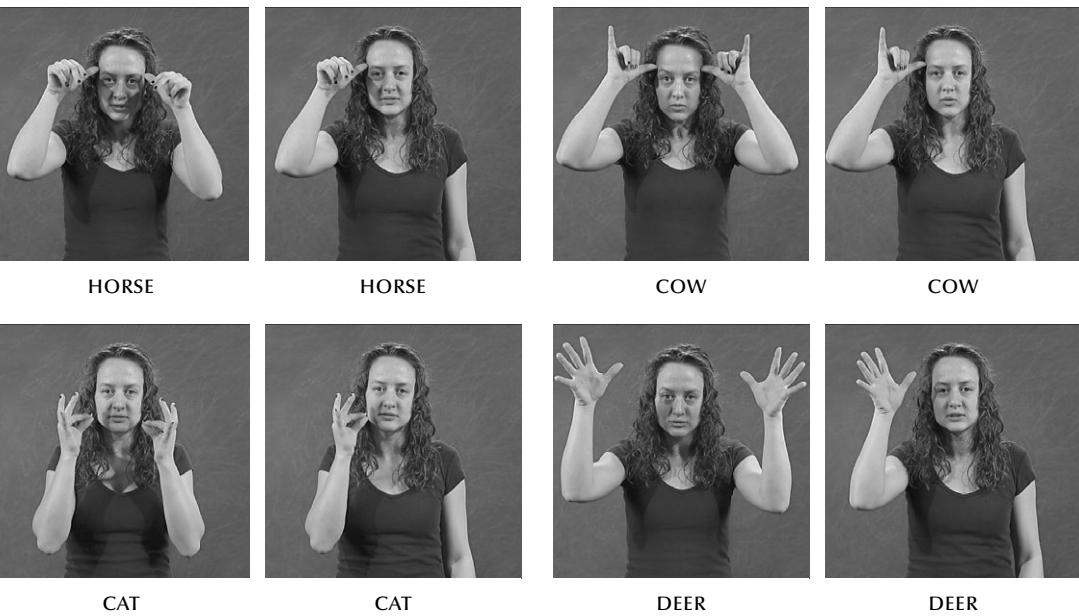


Figure 25. Weak hand deletion.

handshape of GET-OFF-SNOWMOBILE. Similarly, when signers produce the sequence PRO-1 KNOW, very often the 1 handshape of PRO-1 becomes the Bent B handshape of KNOW. We will talk about assimilation more when we talk about compounds in unit 11.

WEAK HAND DELETION

Sometimes the weak or passive hand is deleted from two-handed signs. This is more likely to occur when both hands perform an identical action. In some cases, deletion has resulted in historical changes, as in HORSE, COW, CAT, and DEER (see Figure 25).

SUPPLEMENTAL READING

“Variation: Basic Concepts,” by Ceil Lucas, Robert Bayley, and Clayton Valli (2003); pp. 512–515

REFERENCES

- Liddell, S. K., and R. E. Johnson. 1989. American Sign Language: The phonological base. *Sign Language Studies* 64:195–277.
Lucas, C., Bayley, R., and Valli, C. 2001. *Sociolinguistic variation in American Sign Language*. Washington, DC: Gallaudet University Press.

Homework Assignment 5

1. Watch “The Snowmobile” on the DVD. Find two examples of assimilation. For each example, write down the glosses and the Movement–Hold notation for both signs. Describe where the assimilation occurs and identify whether it is handshape assimilation, location assimilation, orientation assimilation, etc.
2. Find one example of weak hand lowering or weak hand deletion in “The Snowmobile.” Write down the gloss, a description of what the citation form would be, and an explanation of the weak hand lowering or deletion that occurred.

UNIT 8

Summary

Here is a summary of the material that has been covered on ASL phonology. The key points to remember are as follows:

1. Like the symbols of spoken languages, the symbols of sign languages have parts.
2. The study of the smallest contrastive parts of a language is called phonology.
3. Before Stokoe's analysis, signs were thought to be unanalyzable wholes.
4. Stokoe's model makes the claim that signs are composed of three simultaneously produced parameters—the location, the handshape, and the movement. Stokoe demonstrated simultaneous but not sequential contrast.
5. Liddell and Johnson's model makes the claim that signs are composed of sequentially produced movements and holds. The handshape, location, orientation, and nonmanual information is contained in bundles of articulatory features. Sequential contrast can be demonstrated.
6. The Movement–Hold Model allows for the level of detail needed for the adequate description of sign structure and of sign processes in ASL.
7. The Movement–Hold Model demonstrates that the fundamental structure of sign languages is parallel to the fundamental structure of spoken languages. Stokoe stated that the structure of sign language is fundamentally different from the structure of spoken languages. He supported this theory with his claim that the parameters are simultaneously produced.
8. There are phonological processes in ASL that may influence how the parts of signs are produced or the order in which the parts are produced.

PERSPECTIVES ON THE STRUCTURE OF SIGNS

1. Before Stokoe, signs were thought of as unanalyzable wholes.

Stokoe (1960; 1965) described and analyzed signs. From his research, he concluded that signs have parts; signs have three parameters—handshape, movement, and location. (Orientation was added to the system later.) According to Stokoe, sign morphemes are different from the morphemes and words of spoken languages because they are seen as simultaneously, not sequentially produced.

Liddell and Johnson (1982 to the present) agreed with Stokoe that signs have parts, but they disagreed on the number of parts. Liddell and Johnson found that signs have five parameters—handshape, movement, location, orientation, and nonmanual signals.

2. Signs can be segmented into movements and holds.

Liddell and Johnson also found sign language phonology parallels spoken language phonology. Both spoken languages and sign languages divide the segments that make up the words or signs into two major types of units:

- a. Consonants and vowels in spoken languages.
- b. Holds and movements in sign languages.

A final key point to remember is that descriptions of the structure and use of sign languages and claims about how the phonology works are based on empirical observation and the formation of hypotheses that may end up being erroneous. This is true for the description of all parts of the language, not just phonology. If we discover that a hypothesis is wrong, we revise it based on our research findings. That is what the scientific method is all about: testing hypotheses using empirical data and revising the hypotheses if necessary.

PART
THREE

MORPHOLOGY

UNIT 9

Building New Signs

In part 2, we defined phonology as the study of the smallest *contrastive* parts of language. In American Sign Language, signs are made up of hold segments and movement segments. A hold segment has handshape, location, orientation, and nonmanual features, and likewise, a movement segment has handshape, location, orientation, and nonmanual features.

In comparing the signs LOUSY, AWKWARD, and PREACH with the signs THREE-WEEKS, THREE-DOLLARS, and NINE-MONTHS, we saw that the handshape in LOUSY, AWKWARD, and PREACH has no separate meaning. In those three signs, as in many others, the handshape, location, orientation and nonmanual information combine to produce one meaning. The separate parts can be identified, but they do not each have separate meaning. That is not the case, however, in THREE-WEEKS, THREE-DOLLARS, and NINE-MONTHS. In these three signs, the handshape does have a separate meaning—it indicates a specific quantity. To change the handshape in the sign THREE-DOLLARS immediately changes the meaning of the quantity of money being signed. To change the handshape in THREE-WEEKS or NINE-MONTHS changes the meaning of the number of weeks or months being talked about. (This process will be discussed more in unit 13, when we talk about numeral incorporation.)

Phonology is the study of the smallest contrastive parts of language. The parts of language that we study in phonology do not have meaning. So when we study phonology and we look at the sign THREE-WEEKS, we are simply interested in the fact that the sign has a handshape, a location, an orientation, and a movement. The fact that the handshape has the specific meaning of the quantity three is part of morphology.

MORPHOLOGY

Morphology is the study of the smallest *meaningful* units in language and of how those meaningful units are used to build new words or signs. Put another way, morphology is the study of word formation, of how a language uses smaller units to build larger units.

The smallest meaningful unit in a language is a *morpheme*. Some morphemes can occur by themselves, as independent units. These are called *free* morphemes. The English words *cat* and *sit* are examples of free morphemes; the ASL signs CAT and LOUSY are examples of free morphemes. Some morphemes cannot occur as independent units; they must occur with other morphemes. These are called *bound* morphemes. The English plural *-s* (*cats*) and third person *-s* (*sits*) are examples of bound morphemes; the 3 handshape in the ASL signs THREE-WEEKS and THREE-MONTHS are examples of bound morphemes. And as we will see, while a morpheme is often an identifiable form, a morpheme may also be a process.

Languages have many ways to build new words or signs. Using the patterns of words or signs that already exist, they can create totally new forms. They can also make compound words or signs by combining two forms that already exist. They can borrow words or signs from other languages, and ASL can create new signs based on the writing system of English. We will discuss examples of all these processes in ASL.

As a language uses smaller units to build larger ones, two different processes are at work. Some of the larger units built from smaller units are the result of a *derivational* process, and some are the result of an *inflectional* process.

DERIVATIONAL MORPHOLOGY

Derivational morphology is the process of making new units for the language, in other words, deriving new units. An example of derivational morphology in English is the creation of nouns from verbs by the addition of the suffix *-er*. For example, when the suffix *-er* is added to the verbs *write*, *read*, and *sign*, the result is a noun with the meaning of “person who does the activity of the verb.” The nouns *writer*, *reader*, and *signer* are derived from the verbs *write*, *read*, and *sign*. Another example from English is the derivation of verbs from adjectives by the addition of the suffix *-en*. For example, when *-en* is added to the adjectives *soft* and *hard*, the verbs *soften* and *harden* are derived.

In spoken languages, these pieces of added language are called *affixes*. Affixes are bound morphemes that attach to a free morpheme, also called a root or stem, to form a more complex multimorphemic word. English affixes can be *prefixes* or *suffixes*. Prefixes come before the root: *un-*, *in-*, *re-* as in *undecided*, *indecent*, and *recharge*. Suffixes come after the root: *-ness*, *-ing*, *-s*, as in *redness*, *trying*, and *cats*. Some languages also have *infixes*. For example, in Tagalog, a language spoken in the Philippines, the infix *-um-* is added to the first syllable of a verb.

| | |
|----------------|----------------------|
| langoy 'swim' | lumangoy 'swam' |
| kain 'eat' | kumain 'ate' |
| taas 'be tall' | tumaas 'became tall' |
| bili 'buy' | bumili 'bought' |

Tagalog has borrowed the English word *graduate* as a verb, so a speaker saying “I graduated” uses the derived form *grumaduate*.

ASL also contains examples of derivational morphology. In these cases, small units of ASL are put together to create new larger units. As in English, ASL nouns can be derived from verbs (for example, CHAIR from SIT). Compounds are formed when individual signs combine to create a new sign with a new meaning (GIRL + SAME = SISTER). Fingerspelled words can take on the characteristics of a sign by dropping some of the letters (B-A-C-K becomes B-K, with a distinct movement of its own). ASL also allows for *numeral incorporation*, in which a handshape representing a specific number is incorporated into the segmental structure of a sign to convey an explicit period of time (THREE-WEEKS, FIVE-MONTHS). The agentive suffix can be added to existing signs to make nouns like TEACHER, LAWYER, and ACTOR. Finally, new signs are created via blending and depiction (see unit 19 for a full explanation).

INFLECTIONAL MORPHOLOGY

Inflectional morphology is different from derivational morphology. While derivational morphology is about the creation of new units, inflectional morphology is the process of adding grammatical information to units that already exist. For example, when -s is added to nouns in English, the result is the meaning of plural—*cats, dogs, books*, and these units remain nouns. The -s is known as an *inflection*. Another example is the -s that is added to verbs with the meaning of “third person,” as in *walks, writes, or signs*. This -s is also an inflection. The inflections add grammatical information to a unit; they do not result in the creation of a new unit.

SUMMARY

Both derivational and inflectional processes in ASL may be fundamentally different from such processes in spoken languages. ASL does not tend to add on as spoken languages do. Instead, ASL tends to change the fundamental structure, as in the case of temporal aspect, or change one part of one segment, as in the case of indicating verbs (these will be explained in later units).

The same part of a language can be affected by both derivational and inflectional processes. For example, the ASL verb SIT can be used to derive the noun CHAIR, and it can be inflected to mean SIT-FOR-A-LONG-TIME. The ASL verb TALK can combine with the sign NAME to create the compound MENTION, which is a derivational process. The same ASL verb TALK also can be inflected to mean TALK-FOR-A-LONG-TIME.

Some components of ASL become part of the language through a derivational process and then participate in inflectional processes. For example, the formation of the lexicalized fingerspelled sign #NO is a derivational process. It is the creation of a new unit in ASL. That same lexicalized sign can then be used as a verb, as in *He says no to me or I say no to him*.

SUPPLEMENTAL READINGS

Files 5.1, 5.3, and 5.4 from *Language Files: Materials for an Introduction to Language and Linguistics* (2004); pp. 332–347

Homework Assignment 6

Refer to File 5.1 in the Supplemental Readings to help with this assignment.

1. List two or more examples of bound inflectional morphemes in English or another spoken language that you know and explain why they are inflectional.
2. List two or more examples of bound derivational morphemes in English or another spoken language that you know and explain why they are derivational.

UNIT 10

Deriving Nouns from Verbs

In unit 9, we said that morphology is the study of word formation, of how a language uses meaningful units to build new words or signs. One example of a morphological process is the way that a language uses verbs to derive nouns. That is, the verbs that are already in the language are used to create nouns. English has a group of verbs from which nouns have been made. In each of these cases, the difference between the verbs and nouns is found in the stress placed on different syllables. From the examples in Table 2, we can see two regular patterns emerge.

1. The verbs tend to be stressed on the second syllable (some verbs can receive stress on either syllable, such as *import* or *contrast*), and the nouns tend to be stressed on the first syllable. Stress means that a particular sound in a word, usually a vowel, is more prominent; that is, it is said with more emphasis.
2. Because of the difference in stress between a noun and a verb, the vowels in the two words sound different. This means, for example, that the vowel sounds in the first syllable of the verb *convert* and in the noun *convert* sound different.

Table 2. Nouns Derived from Verbs in English

| Verbs | Nouns |
|----------|------------|
| convíct | cónvict |
| segmént | ségment |
| subjéct | súbject |
| présent | présent |
| impáct | ímpact |
| impórt | ímport |
| incréase | íncrcrease |
| contrást | cóntrast |
| insúlt | ínsult |
| insért | ínsert |
| protést | prótest |
| convért | cónvert |
| projéct | próject |
| rebél | rébel |
| conflict | cónflict |

Note: The stress is indicated by the slash mark over the vowel.

This is just one of the regular patterns in the relationship between verbs and nouns. Another example in English occurs when the suffix *-er* is added to verbs, which transforms the verbs into nouns. For example, adding *-er* to the English verbs *write*, *dance*, *walk*, and *think* results in the nouns *writer*, *dancer*, *walker*, and *thinker*. Again, there is a regular pattern in the relationship between verbs and nouns. These patterns illustrate an earlier point—morphology is about the creation of new units, and one way to create new units is to take a form that already exists in the language and change it in some way.

These two examples from English morphology illustrate the difference between a morpheme that is a *form* and a morpheme that is a *process*. In the case of adding *-er* to a verb in order to form a noun (*walk/walker*), *-er* is a form that consists of two sounds; it is a form that is added on to other forms to create a new word. Since it cannot occur by itself, it is a bound morpheme. However, in the case of the verb *subjéct* and the noun *súbject*, we can't identify a specific form that is added to the verb to derive the noun; in other words, we can't see a morpheme. We can see that the stress on the verbs is consistently different from the stress on the nouns. On the verbs, it is generally on the second syllable, while on the nouns, it is on the first syllable (for example, *contést/cóntest*, *prógress/prógress*). The process of moving the stress to the first syllable results in the creation of a noun related to the verb. This concept of the morpheme as a process is important in understanding ASL morphology.

ASL also has verbs and nouns that show a regular pattern. Some examples of verbs and nouns that are related in ASL are listed in Table 3.

Table 3. Related Verbs and Nouns in ASL

| Verbs | Nouns |
|--------------------|---------------|
| FLY | AIRPLANE |
| GO-BY-BOAT | BOAT |
| GO-BY-SKIS | SKIS |
| CALL | NAME |
| SELL | STORE |
| OPEN-BOOK | BOOK |
| SIT | CHAIR |
| PUT-GAS-IN | GAS |
| OPEN-DOOR | DOOR |
| CLOSE-WINDOW | WINDOW |
| PUT-ON-CLOTHES | CLOTHES |
| PUT-ON-HEARING-AID | HEARING-AID |
| PUT-ON-PERFUME | PERFUME |
| LICK-ICE-CREAM | ICE-CREAM |
| COMB-HAIR | COMB |
| USE-BROOM | BROOM |
| USE-SHOVEL | SHOVEL |
| PAINT | PAINT |
| IRON-CLOTHES | IRON |
| ICE-SKATE | ICE-SKATES |
| ROLLER-SKATE | ROLLER-SKATES |
| PRINT | NEWSPAPER |

These noun-verb pairs were first analyzed by Ted Supalla and Elissa Newport, two researchers who published their findings in 1978. Supalla and Newport noticed that there are pairs of verbs and nouns in ASL that differ from each other only in the movement of the sign. For example, in the pair SIT and CHAIR, the handshape, location, and orientation of the two signs are the same, but the movement is different. It is the movement that creates the difference in meaning between the two signs. In the same way, the handshape, location, and orientation of FLY and AIRPLANE are the same, but the movement is different.

Supalla and Newport focused on movement and described the differences between verb movement and noun movement in great detail. By looking at pairs of verbs and nouns within the Liddell and Johnson framework for describing signs, we can say that related verbs and nouns may have the same handshape, location, and orientation, and that the noun simply repeats or *reduplicates* the segmental structure of the verb (see Figure 26). The segmental structure is the movements and holds of a sign. So, for example, the basic structure of the verb SIT is hold-movement-hold, and the basic structure of the noun CHAIR is a hold-movement-hold repeated. A diagram of the structure of the two signs is as follows:

| | |
|-------|---------------|
| SIT | CHAIR |
| H M H | H M X M X M H |

Notice the movement after the first hold in CHAIR. This is an example of movement epenthesis (see p. 47), which happens when nouns are derived from verbs in ASL. The basic structure of the verb is repeated, so when the last segment of the verb is a hold, a movement is added before the first segment of the verb is repeated. The result of reduplicating the verb structure is H M H M H M H. Verbs have different segmental structure. Look through the list of verbs and nouns in Table 3 and

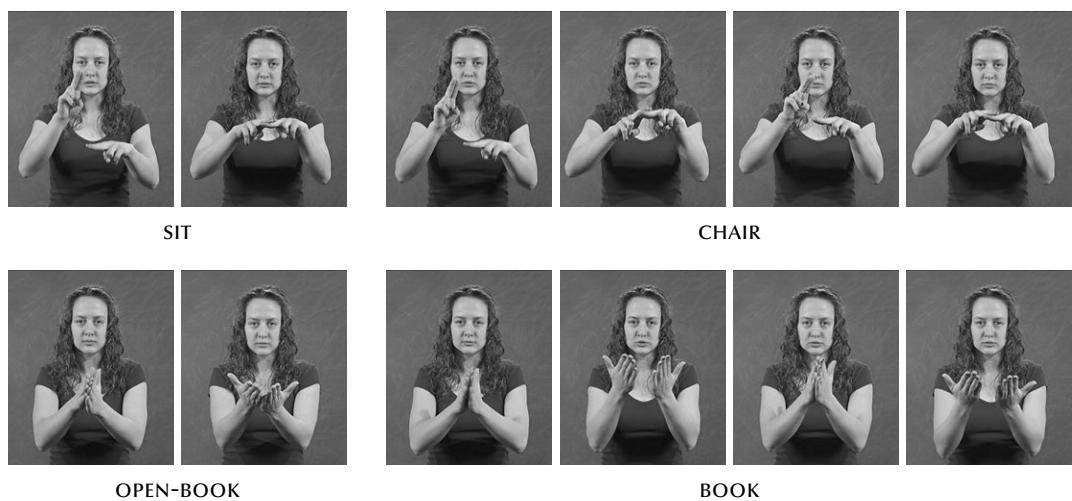


Figure 26. Noun and verb pairs that differ in movement.

describe the basic structure of the verbs; note how that basic structure is repeated to form the noun.

This process of repetition is called *reduplication*. Similar to the derivation of nouns from verbs in English, the morpheme in ASL is the process of reduplication. We do not add a form to the ASL morpheme SIT to derive the noun CHAIR; we repeat the morpheme SIT.

We see reduplication in spoken languages also. The Indonesian word for “mother” is *ibu*; the plural, “mothers,” is *ibuibu*. In Tagalog, the future tense is formed with reduplication, so that the future of *sulat*, “write,” is *susulat* and the future of *basa*, “read,” is *babasa*.

REFERENCE

- Supalla, T., and Newport, E. 1978. 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, 91–132. New York: Academic Press.

Homework Assignment 7

1. On the DVD, "The Snowmobile" (Val Dively) and "Applause for Eyes to See" (Bernard Bragg) both have examples of nouns that have related verbs in ASL and verbs that have related nouns. Find one example of each, as follows:
 - a. Noun in a story:
 - b. Related ASL verb (may not be on the DVD):
 - c. Verb in a story:
 - d. Related ASL noun (may not be on the DVD):
2. List three examples of noun-verb pairs not included in this unit.
 - a.
 - b.
 - c.
3. Which of the following sets are noun-verb pairs in ASL and which have unrelated signs for the noun and the verb?

| | |
|-------------------|---------|
| a. PUT-IN-JAIL | JAIL |
| b. PUT-ON-EARRING | EARRING |
| c. SHOOT-GUN | GUN |
| d. MAIL-LETTER | LETTER |
| e. DRIVE-CAR | CAR |

UNIT 11

Compounds

COMPOUNDS IN ASL

In unit 10, we saw that one way that ASL can create new signs is by deriving nouns from verbs. In this unit, we will look at another way that ASL can create new signs. Sometimes a language creates new words by taking two words (free morphemes) that it already has and putting them together. This process is called *compounding*. Both English and ASL have many compounds. We will first look at some examples from English.

In English, the word *green* is combined with the word *house* to make the word *greenhouse*. The word *black* is combined with the word *board* to make the word *blackboard*. Some other examples of English compounds are *hatrack*, *railroad*, *bookcase*, *blackberry*, *showroom*, and *homework*.

When nouns are derived from verbs in English or in ASL, a regular pattern can be described. A pattern can also be described for the formation of compounds. In English, when two words come together to form a compound, two fairly predictable changes take place.

1. The stress (that is, the emphasis) is usually on the first word of the compound, and the stress on the second word is usually reduced or lost. When the word *green* and the word *house* come together to form the compound *greenhouse*, the stress is on the word *green*: *grünhouse*.
2. A new meaning is created when two words come together to form a compound. For example, *greenhouse* does not mean a house that is green; it has the specific meaning of a place where plants are grown. *Blackboard* does not mean a board that is black; it means a board that is used for instructional purposes, which may be black, green, or brown.

The research done by Supalla and Newport on nouns and verbs in ASL has already been mentioned. Another researcher, Scott Liddell, has done a great deal of research on compounds in ASL (see Table 4 for examples of ASL compounds). He noticed that when two signs come together to form a compound, predictable

Table 4. ASL Compounds

| ASL Compound | English Translation |
|---------------|----------------------------|
| GIRL SAME | "sister" |
| BOY SAME | "brother" |
| MOTHER FATHER | "parents" |
| BLUE SPOT | "bruise" |
| THINK MARRY | "believe" |
| THINK SAME | "it's like"; "for example" |
| THINK TOUCH | "be obsessed with" |
| TALK NAME | "mention" |
| FACE NEW | "stranger" |
| GOOD ENOUGH | "just barely adequate" |
| JESUS BOOK | "Bible" |
| LOOK STRONG | "resemble" |

Note: The symbol between the two glosses indicates that the sign is a compound.

changes take place as the result of rule application, just as they do in English-compound formation. There are two kinds of rules that cause the changes—morphological and phonological.

Morphological rules are applied specifically to create new meaningful units (in this case, compounds). Three morphological rules are used to create compounds in ASL: (1) the first contact hold rule, (2) the single sequence rule, and (3) the weak hand anticipation rule.

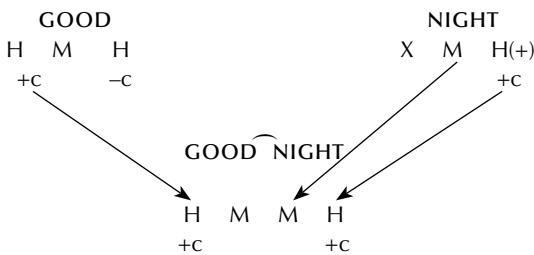
1. Sometimes the hold segment of a sign includes contact on the body or the other hand (+c). In compounding, the first or only contact hold is kept. This means that if two signs come together to form a compound and the first sign has a contact hold in it, that hold will stay. A preceding movement may be deleted, as may noncontact (−c) holds. If the first sign does not have a contact hold but the second sign does, that contact hold will stay. It is important to notice that while the hold may appear in the compound, the actual contact may not. For example, the sign GOOD has the structure

| | | |
|----------|---|----------|
| H | M | H |
| +contact | | −contact |

The sign NIGHT has the structure:

| | | |
|---|---|----------|
| X | M | H(+) |
| | | +contact |

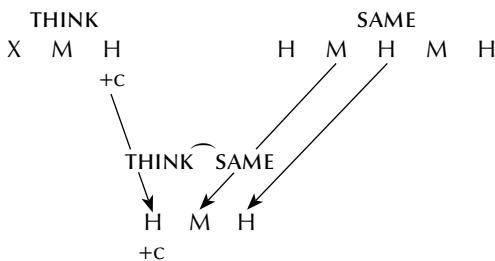
The (+) following the H in NIGHT means that the sequence X M H is repeated. When the sign GOOD and the sign NIGHT come together to form the compound GOOD NIGHT, the first contact hold of GOOD is kept, and one movement-hold sequence of NIGHT is kept. The transition to the compound is as follows:



It happens that both GOOD and NIGHT have contact holds. But in the compound THINK SAME, only THINK has a contact hold. The structure of THINK is

X M H
+c

The structure of SAME is H M H M H; it does not have contact holds. When THINK and SAME come together to form a compound, the contact hold in THINK is kept, and one hold-movement-hold sequence of SAME is dropped. The structure of THINK SAME results from these changes (see Figure 27).



Notice that in the compound GOOD NIGHT, an M is added after the final H in GOOD. This is an epenthetic M, which we will discuss shortly.

- When compounds are made in ASL, internal movement or the repetition of movement is eliminated. This is called the single sequence rule. We saw in the sign NIGHT that the M H sequence is repeated. Other signs that show repetition include GIRL, WORK, and NAME. Signs that have internal movement include MOTHER and FATHER. The internal movement occurs while the hand is in the hold segment. In MOTHER and FATHER, the wiggling of the fingers is the internal movement. When these signs come together with other signs to form compounds, the repetition or internal movement is eliminated. For example, the following compounds don't show any repetition:

GIRL SAME "sister"

TALK NAME "mention"

And in the sign for "parents," the fingers do not wiggle as they do in the individual signs MOTHER and FATHER.

- When two signs are combined to form a compound, it often happens that the signer's weak hand anticipates the second sign in the compound. For example, in the compound SISTER (GIRL SAME), the weak hand appears in the space in front of the signer with the 1 handshape of the sign SAME at the same time that the active hand is producing the sign GIRL (see Figure 27). This can also be seen in the

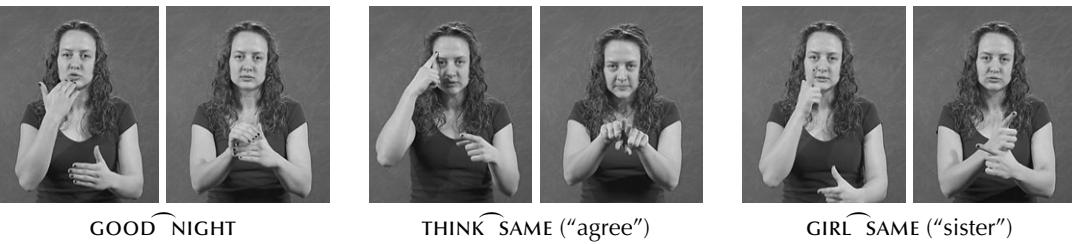


Figure 27. Examples of ASL compound signs.

compound BELIEVE (THINK MARRY) in which the weak hand appears with the C handshape of the sign MARRY while the active hand produces the sign THINK.

Phonological rules may be applied whenever signs are produced in sequence and do not result in any changes in meaning. We see at least three different phonological rules occurring with compounding: (1) movement epenthesis, (2) hold reduction, and (3) assimilation.

1. We described movement epenthesis in the unit on phonological processes. It involves adding a movement segment between the last segment of one sign and the first segment of the next sign. An example of movement epenthesis in compounding can be seen in the compound THINK SAME, where a movement segment is added between the final hold of THINK and the first movement of SAME. It should be noted that in the final production of a compound, the epenthetic movement may assimilate to a following movement. For example, in the sign SISTER, an epenthetic movement occurs between the final hold of the first sign, GIRL, and the initial movement of the second sign, SAME, producing the structure H M M H. However, the structure of the compound in actual production is H M H.
2. A second phonological rule that applies when two signs come together to form a compound is that noncontact holds between movements are shortened. This is an example of the process of hold reduction that was discussed in unit 7. We saw this happen to the sign GOOD in the compound GOOD NIGHT. We also see it in the compound LOOK STRONG. The structure of the sign LOOK is M H, and the structure of the sign STRONG is H M H. None of the holds in these two signs have contact with the body or with the other hand. When these two signs come together to form a compound, they look like this:

| LOOK | STRONG |
|-------|--------|
| M H M | H M H |

An epenthetic M occurs between the two signs. The holds between the movements are shortened and the result is

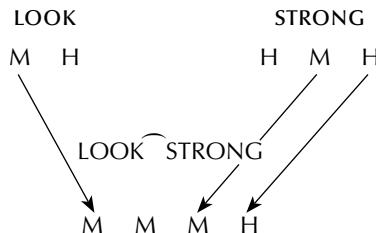




Figure 28. One- and two-handed versions of the compound LOOK STRONG.

Notice that this is the structure of the compound when it is first formed. Another version of the compound consists of H M H, with the index finger touching the nose on the first hold.

3. As we said in the unit on phonological processes, assimilation means that a segment takes on the characteristics of another segment near it, usually the one just before it or after it. Assimilation occurs frequently in ASL compounds. In the compound BELIEVE, the handshape of the sign THINK may change to look more like the handshape of the sign MARRY; in RESEMBLE (LOOK STRONG), the location of the sign STRONG may be closer to the location of the sign LOOK (see Figure 28).

The result of compounding is that a new meaning is created. It may not be possible to predict the meaning of the new sign simply by looking at the two signs that form the compound. For example, the signs THINK and MARRY form the compound BELIEVE, but new signers cannot guess the meaning of the compound and many native signers are surprised to learn the origin of the compound. Likewise, the signs LOOK and STRONG come together to form the sign RESEMBLE, but the meaning of the compound is not obvious simply from the joining of the two signs. Similarly in English, simply knowing the meaning of the words *green* and *house* that form the compound *greenhouse* will not be sufficient to figure out the meaning of the compound.

We see that, as in English, compound formation in ASL is a rule-governed process. ASL has a way of creating new signs by putting together signs that already exist in the language, and when two signs come together to form a compound, predictable and describable changes happen. The following list summarizes the compounding process.

1. First Contact Hold Rule. If the initial sign in the compound has a hold that contacts the body, eliminate everything but that contact hold. For example, in GOOD NIGHT and GOOD ENOUGH, the initial sign (GOOD) has a contact hold at the chin. The rule says to keep that contact hold and eliminate the rest of the sign GOOD. The result is that the first half of the compound now consists of just a contact at the chin.
2. Single Sequence Rule. Do not repeat identical X M H sequences. This applies to the initial or final signs in a compound.

| Initial Sign | Final Sign |
|--------------|----------------|
| GIRL in GIRL | ENOUGH in GOOD |
| BLUE in BLUE | NAME in SAY |
| NAME in NAME | NIGHT in GOOD |

Exceptions to the rule include TRUE WORK and FORMAL .

3. Weak Hand Anticipation Rule. If the first sign is one-handed and the second sign is two-handed, the entire sign becomes two-handed. The weak hand from the second sign is present from the very start. For example, in GOOD ENOUGH, the weak hand S handshape of ENOUGH is already in place as GOOD is signed. In BLACK NAME, the weak hand U handshape of NAME is already in place as BLACK is signed, and in THINK MARRY, the weak hand cupped B handshape of MARRY is already in place as THINK is signed.

4. Ordering of Compound Formation Rules:

Example: BROTHER

| Citation form | BOY | | | | | | | SAME | | | | | | |
|------------------------------------|---------------------------|---|---|---|---|---|---|------|---|---|---|---|---|---|
| | X | M | X | M | X | M | H | X | M | X | M | X | M | H |
| Application of Morphological Rules | | | | | | | | | | | | | | |
| 1. contacting hold rule | X | M | X | M | X | M | H | X | M | X | M | X | M | H |
| 2. single sequence rule | | | | | X | M | H | | | | X | M | H | |
| 3. weak hand anticipation rule | | | | | | | | | | | | | | |
| | Add weak hand 1 handshape | | | | | | | | | | | | | |

Example: DISAGREE

| Citation form | THINK | | | | OPPOSITE | | | |
|------------------------------------|---------------------------|---|---|---|----------|---|---|---|
| | X | M | H | | X | M | H | |
| Application of Morphological Rules | | | | | | | | |
| 1. contacting hold rule | | | | H | | | X | M |
| 2. single sequence rule | | | | H | | | X | M |
| 3. weak hand anticipation rule | | | | | | | | |
| | Add weak hand 1 handshape | | | | | | | |
| Application of Phonological Rules | | | | | | | | |
| 1. movement epenthesis | H | M | | | X | M | H | |
| 2. hold reduction | X | M | | | | | M | H |

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Homework Assignment 8

- 1.** For each of the English translations of ASL compounds listed below, write down the two signs that come together to form the compound and describe the changes that happen when the two signs come together.

Example: "good night"

| | GOOD | | | NIGHT | | | | |
|------------------------------------|---|---|---|---------------|---|---|---|---|
| Citation form | H | M | H | X | M | H | M | X |
| Application of Morphological Rules | | | | | | | | |
| 1. contacting hold rule | H | | | X | M | H | M | X |
| 2. single sequence rule | H | | | X | M | H | | |
| 3. weak hand anticipation rule | | | | Add weak hand | | | | |
| Application of Phonological Rules | | | | | | | | |
| 1. movement epenthesis | H | M | | X | M | H | | |
| 2. hold reduction | H | M | | | | M | H | |
| Result | | | | H | M | M | H | |
| | a. "believe" e. "Bible" | | | | | | | |
| | b. "wife" f. "resemble" | | | | | | | |
| | c. "husband" g. "mention" | | | | | | | |
| | d. "home" | | | | | | | |

- 2.** List at least four other compounds in which the first sign is either THINK or MIND.

Example: THINK \frown OPPOSITE "to disagree with"

- a.**
 - b.**
 - c.**
 - d.**
- 3.** Watch "The Snowmobile" on the DVD. Find three compounds used in the story. Write down which two signs form each compound and its English translation.
- a.**
 - b.**
 - c.**

UNIT 12

Fingerspelling

FINGERSPELLING

ASL creates new signs in a third way—by representing the symbols of written English with ASL signs. This process is commonly referred to as fingerspelling. We will refer to these signs as fingerspelled signs.

Robbin Battison, an ASL linguist, did the first research on fingerspelling in ASL. He noticed, among many things, that when a written English word is represented with ASL signs, different changes may take place. It is important to notice that what have traditionally been called the “letters” of fingerspelling are ASL signs, each with a segmental structure and a handshape, location, and orientation. It is true that the handshapes of the signs may resemble the written symbol, and it is true that fingerspelling in ASL is the direct result of language contact with English. For example, the handshape of the sign C may look like the written English symbol C, but the sign is a sign and not a letter.

From a morphological perspective, these signs are free morphemes. A signer may produce each morpheme distinctly in what we will call full fingerspelling. This is represented with dashes, as in w-h-a-t. In actual production, however, changes often take place when fingerspelling morphemes are produced in sequence. A number of separate morphemes may begin to act like one single morpheme, like a single sign. This what we refer to as lexicalized fingerspelling, and we use the symbol # to mark it (see Table 5).

LEXICALIZED FINGERSPELLING

Many people have noticed that the separate signs of fingerspelling tend to blend together when they are produced in fingerspelled signs. That is, they tend to “become like individual signs.” In linguistics, the word *lexicalized* means “like a word,” or “word-like,” that is, like an independent unit. Examples of lexicalization in English include compounds such as *greenhouse*, *breakfast*, and *Christmas*, which are formed by uniting two separate lexical items that function as one word with a unique meaning. Acronyms such as NASA (National Air and Space Administration) and

Table 5. Lexicalized Fingerspelled Signs in ASL

| | |
|--------|-------|
| #BANK | #DO |
| #BACK | #SO |
| #OFF | #OK |
| #ON | #KO |
| #IF | #JOB |
| #SALE | #YES |
| #EARLY | #NO |
| #BUT | #DOG |
| #BUS | #TOY |
| #CAR | #FIX |
| #HA | #WHAT |

scuba (self-contained underwater breathing apparatus) are also examples of lexicalization in English. In these cases, a new word is formed by using the first letter of each word in the phrase.

Lexicalization describes the process of fingerspelling because the separate signs do seem to become like one, to be used like other ASL signs, and to follow the rules of ASL signs. For example, Battison noticed that in general, no sign uses more than two handshapes. This means that a sign like #IF or #OR can preserve both signs and still follow the rules of ASL. However, signs like #BACK or #EARLY present problems because they are formed from four and five signs. The result is that while all of the signs are not immediately lost, there is a tendency to reduce the number of signs as they become more like other ASL signs.

There is a difference between full, formal fingerspelling and lexicalized finger-spelling (see Figure 29), but it is easy to see how quickly the process of lexicalization begins. Just think about how you would fingerspell someone's name if you were introducing them for the first time and then how the form of that fingerspelling would change if you used the name over and over again in a conversation. The changes that you observe are examples of lexicalization.

THE LEXICALIZATION PROCESS

Eight of the changes that are part of the lexicalization process are described in this section. These changes were first described by Battison (1978).

Some of the Signs May Be Deleted

In the lexicalization of #YES, there is a sign Y and a sign S; there is no sign E. While there are signs in ASL with one handshape or two handshapes in sequence, there are very few signs with more than two handshapes in sequence. However, many finger-spelled signs start out with four or more handshapes (for example, #BACK, #RARE, #SURE, #WHAT, and #EARLY). It seems that fingerspelled signs undergo pressure to conform to the rules of ASL structure. One of these rules seems to be "no more

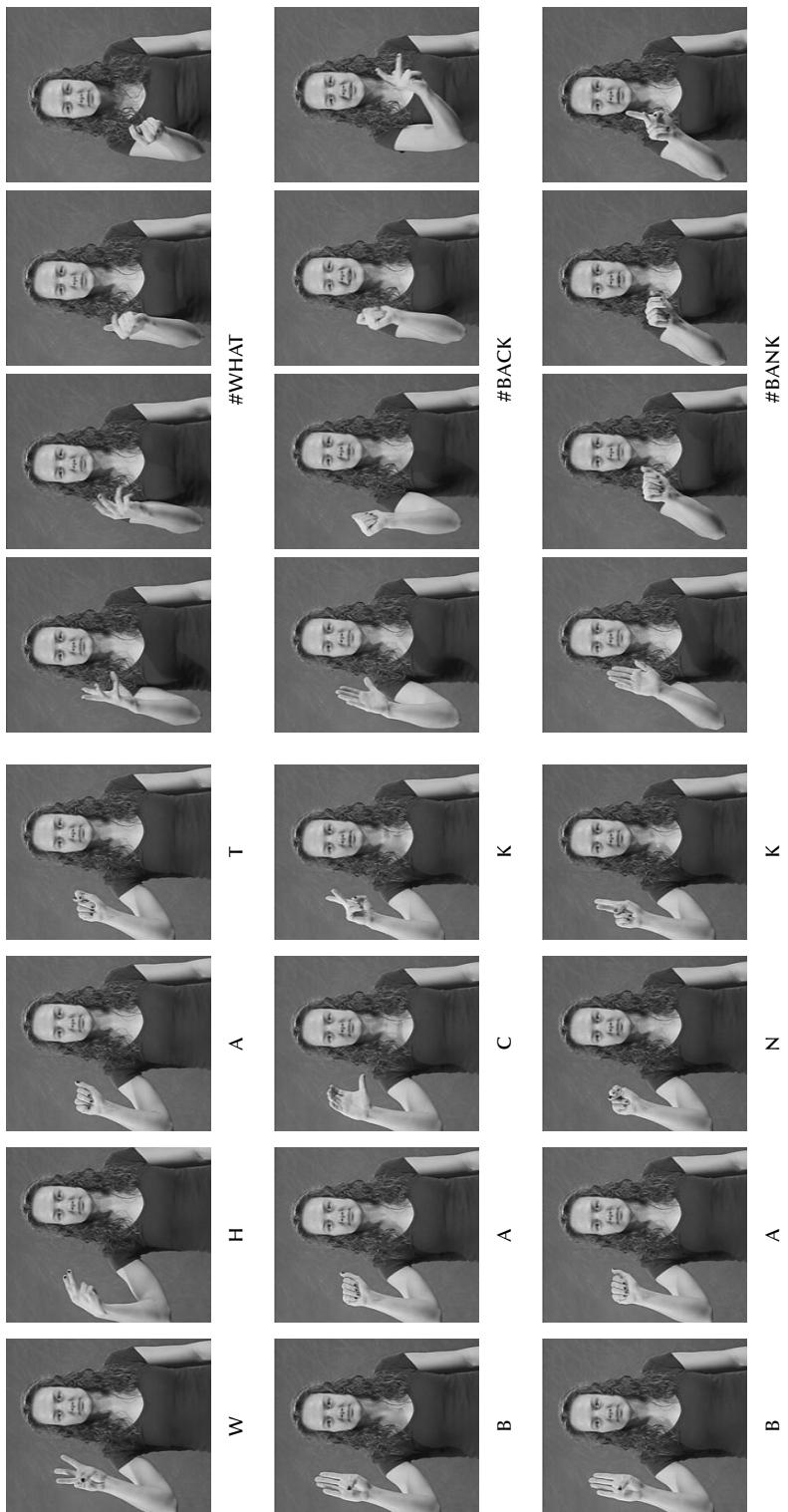


Figure 29. Examples of full and lexicalized fingerspelling.

than two handshapes are allowed in a sign.” This may explain why some signs in fingerspelled signs are deleted, as in #BACK.

Another rule seems to govern the acceptable sequence of handshapes in a sign. That is, it seems that some handshapes can only be followed by certain other handshapes. For example, the sequence of handshapes in the sign CHICKEN is from an Open L-like handshape to a closed Flat O-like handshape. This sequence occurs naturally in ASL. A very similar sequence occurs in the lexicalized fingerspelled sign #NO. Compare the fingerspelled letter N in isolation with the initial handshape in the lexicalized fingerspelled sign #NO. The handshape sequence in #NO more closely fits the pattern for handshape sequences in ASL. But sometimes there are exceptions. The sequence of handshapes in the lexicalized fingerspelled sign #JOB is not typical for ASL signs.

The Location May Change

Battison described the usual place for fingerspelling to take place as an area just below and in front of the signer’s dominant shoulder. In fact, when names or English words are fingerspelled for the first time, they are often fingerspelled in this area. However, fingerspelling is not restricted to this area; the location can change. For example, if someone is obsessed with food, people can talk about the person in a teasing way by signing #FOOD on the forehead. In addition, we will see many examples in which the location of a fingerspelled sign includes grammatical information concerning the subject or object of a verb.

Handshapes May Change

In the sign #CAR, the C handshape has the thumb extended and involves principally the index and middle fingers, and the R also has the thumb extended. The initial N handshape in the sign #NO has the thumb extended.

Movement May Be Added

Within the Liddell and Johnson framework, a fingerspelled sign begins as individual signs that are symbols for English orthographic symbols. Each sign is basically a hold with a handshape, location, and orientation, and these holds are produced in sequence. When a series of holds are produced in sequence, movements are naturally added in the transition between holds. This is an example of the process of movement epenthesis.

The basic structure of the fingerspelled sign B-A-C-K is as follows:

| B-A-C-K | | | | |
|-------------|----------|----------|----------|----------|
| | H | H | H | H |
| Handshape | B | A | C | K |
| Location | sh | sh | sh | sh |
| Orientation | palm out | palm out | palm out | palm out |

However, when a signer produces the holds in sequence, movement is naturally added between the holds. The final structure of the lexicalized fingerspelled sign could probably be described as H M H.

The addition of movement also may be accompanied by a change in location. For example, in the sign #YES, the movement includes a dip in the wrist followed by a pulling back of the S sign; the sign #SALE includes a counterclockwise circular movement; the sign #SURE involves a movement forward with the R sign and a movement backward with the E sign.

The Orientation May Change

The palm orientation of a sign may change in a lexicalized fingerspelled English word. For example, in the sign #JOB, the final orientation of the B sign is palm in, the opposite of what it would be if it were signed alone; in the sign #HA, the orientation of the A sign goes from palm out to palm up.

There May Be Reduplication of the Movement

If one were to fingerspell the written word *ha*, there would be a sign H and a sign A. However, there is a sign #HA in which the index and middle fingers move back and forth repeatedly. The repetition of the movement is called reduplication. Other examples include the signs #NO and #DO.

The Second Hand May Be Added

The sign #WHAT may be produced on both hands simultaneously, as may the sign #BACK. Sometimes this is done for stylistic reasons or to show emphasis. Other times it is because the left hand has different meaning from the right hand. This is discussed next.

Grammatical Information May Be Included

The location of the hands while fingerspelling can indicate the relationship between people or places. The location carries meaning and so is grammatical. For example, someone may be talking about a trip they took to a distant location. In the course of the conversation, they may have set up the location of that place in front of them to the right. When it comes time to talk about returning from that location, they may begin the sign #BACK in that location with the palm facing in, move the sign toward them, and complete it near their body. Similarly, a girlfriend and a boyfriend may have a history of breaking up and getting back together. Someone might describe this by signing #BACK simultaneously on the right hand and the left hand with the palms facing each other and the hands moving together, and by then signing #OFF with the hands moving away from each other. Another example is the

sign #NO, which can be signed away from the signer, meaning “I say no to you or to a third person.” However, it can also be signed with the palm facing the signer, with the meaning of “You (or someone) say no to me.” Here the location and the orientation provide grammatical information about who is the subject and who is the object of the verb. We will discuss this more in the section on verbs.

It is important to realize that lexicalization is a gradual process and that some signs may be more completely lexicalized than others. For example, #NO and #DO have undergone many changes and look like ASL signs, while signs like #BUSY and #EARLY are not as fully lexicalized. Similarly, the sign #MICH, which is a sign in terms of meaning and use (it is clearly used and understood as the name for the state of Michigan), is less lexicalized as it retains four handshapes in a sequence not found in natural ASL signs (see “The Snowmobile” on the DVD).

Acronyms in written language can also be fingerspelled, for example, FBI, CIA, and NAD. Spoken language representations of letters, such as “TV” in spoken English, can also be fingerspelled. Spoken English expressions such as “as soon as possible” or “asap” and “for your information” or “fyi” are signed in ASL, #ASAP and #FYI. And recently, expressions from written electronic communication such as LOL (“laughing out loud”) and OMG (“Oh, my God”) have entered ASL through fingerspelling.

Three final observations about these signs can be made.

1. Quite often, ASL has both a lexicalized fingerspelled sign and a sign for the same concept. For example, CAR and #CAR, BED and #BED, BUSY and #BUSY.
2. People often produce combinations of lexicalized fingerspelled signs and signs (such as LIFE#STYLE) or choose to fingerspell parts of sentences that could just as well be signed. Some very interesting research has been done on this by Arlene B. Kelly at Gallaudet University.
3. People often use both hands to fingerspell or they may sign with one hand and fingerspell with the other, either at the same time or alternately during a conversation. Again, research on this extremely interesting area is just beginning.

Researchers are also studying the two-handed fingerspelling used by British and Australian signers and the representation of writing systems used by deaf people who are in contact with written Chinese, written Arabic, written Hebrew, written Russian, written Amharic (a language spoken in Ethiopia), and many other written languages. All of these languages have written symbol systems that are very different from written English. Deaf people in contact with all of these written languages have manual ways of representing the written system, in the same way that American deaf people represent the alphabet with signs. For example, signers from countries whose written language contains accents, such as French, may add the accents manually when they fingerspell. In Taiwan Sign Language, deaf people produce signs that represent the characters of written Chinese (Ann, 1998). Like ASL, the structure of these character signs is somewhat different from that of regular Taiwan Sign Language signs.

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Homework Assignment 9

- 1.** Look at the stories on the DVD entitled “A Little Bit at a Time,” “Applause for Eyes to See,” and “Spelling?” and find four examples of full fingerspelling. List them and explain why you think they occur. Remember that full fingerspelling is represented with dashes: C-A-T.
- 2.** Look at the ASL PAH! stories on the DVD and find four examples of lexicalized fingerspelling. Explain what changes have taken place in terms of the eight changes discussed in this unit: deletion/addition, location, handshape, movement, orientation, reduplication, second hand, and grammatical information. Remember that lexicalized fingerspelling is represented with the pound sign (#): #BANK.
- 3.** Fingerspell your first name and describe the changes that take place when it is fingerspelled over and over, in terms of the eight changes described in this unit.

UNIT 13

Numeral Incorporation

So far in our discussion of ASL morphology, we have looked at how whole signs that already exist are used to derive new signs. We have seen how verbs are used to derive nouns, such as SIT and CHAIR; what changes we expect when two signs come together to form a compound, such as BELIEVE or SISTER; how English orthographic symbols are represented by ASL fingerspelling signs, such as #BACK or #JOB; and how signs from other sign languages are borrowed into ASL, such as ITALY or CHINA. It is important to notice that while the parts of signs may change or disappear as a result of the morphological processes described, the starting point for the processes are free morphemes.

In this unit, we will look at how bound morphemes (that is, meaningful units that cannot occur alone) can combine to create new meanings. Signs are composed of movements and holds, and the information about handshape, location, orientation, and nonmanual signals is contained in bundles of articulatory features that are a part of the movements and holds. For example, the sign WEEK would be represented as follows:

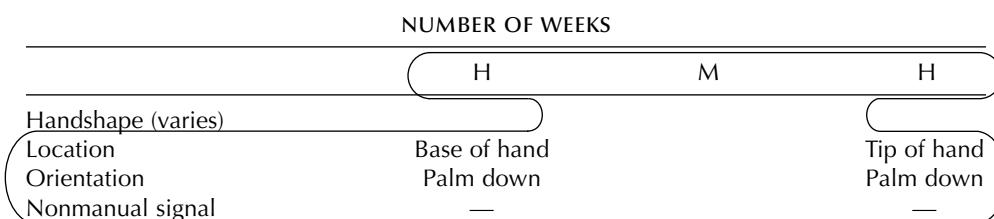
| WEEK | | | |
|------------------|--------------|---|----------------|
| Strong Hand | H | M | H |
| Handshape | 1 | | 1 |
| Location | base of hand | | tip of fingers |
| Orientation | palm down | | palm down |
| Nonmanual signal | — | | — |

However, we know that the concept of *two weeks* or *three weeks* can be expressed in ASL by changing the handshape of this sign. By changing the handshape from a 1 to a 2 or a 3, the number of weeks referred to changes. The location, orientation, and nonmanual signal remain the same. This process in ASL is known as *numeral incorporation* (see Figure 30), and it has been described by Scott Liddell and Robert E. Johnson. We can say that the sign TWO-WEEKS has two meaningful parts (morphemes). One is the part that includes the segmental structure—the holds and



Figure 30. Numeral incorporation in ASL.

the movement—and the location, orientation, and nonmanual signal. It means WEEK. The other meaningful part is the handshape, which has the meaning of a specific number. When the two parts are produced together, the meaning of the sign is “specific number of weeks.” A diagram of the two morphemes would look like this:



The morphemes in this example are *bound* morphemes, that is, morphemes that must occur with other morphemes. For example, the handshape cannot occur by itself. It must occur within a segmental structure, with a location, an orientation, and possibly a nonmanual signal. Bound morphemes are different from *free* morphemes, which may occur by themselves. For example, the sign LOUSY in ASL (along with many other lexical signs) is a free morpheme. Its individual parts—handshape, location, orientation—do not have independent meaning and are not morphemes, but when they are all put together, the result is one meaningful unit, one morpheme. It is interesting to see the difference between the lexical sign LOUSY and the sign THREE-WEEKS. In LOUSY, the individual parts do not have independent meaning and are not morphemes, but the whole sign is a morpheme. The sign THREE-WEEKS has the same handshape as LOUSY, but in THREE-WEEKS, the handshape does have independent meaning and is a bound morpheme. In other words, the sign THREE-WEEKS is made up of two morphemes. What is interesting is that two signs with the same handshape can have such different linguistic structure.

The process of numeral incorporation is very common in ASL. Usually there is a limit to how high the numbers can go. For example, for most native signers, the handshape for WEEK can be changed from 1 through 9; for numbers 10 and higher

the number is signed separately from the sign WEEK. The same is true for MONTHS, DAYS, DOLLARS, and so forth.

Numeral incorporation in ASL can occur with signs such as WEEK, MONTH, DAY, DOLLAR AMOUNT, PLACE IN A RACE, EXACT TIME, PERIOD OF TIME, and HEIGHT. It is important to notice that many of these signs have a characteristic movement, location, and orientation. For example, DOLLAR AMOUNT is generally signed in the area in front of the dominant shoulder, with a sharp twisting movement resulting in a change of orientation; EXACT TIME usually requires that the index finger of the dominant hand contact the passive wrist before moving outward from the wrist. What is important to understand is that the segmental structure (movements and holds) and the location, orientation, and nonmanual signal of each one does not change. All of those parts consist of one morpheme that communicates the main topic. The handshape does change to indicate the specific quantity being discussed.

Signs for age traditionally have been thought of as examples of numeral incorporation, especially for ages 1 through 9, in which the numeral handshape starts at the chin, with the palm out, and moves out. However, work by Scott Liddell has demonstrated that the sign OLD in these constructions functions more like a prefix and extends beyond ages 1 to 9 to include all ages (for example, OLD-22 and OLD-55). Thus, the handshape change that we see in ages 1 to 9, even though it resembles the numeral incorporation of WEEK or MONTH, is the result of phonological assimilation.

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Homework Assignment 10

- 1.** Think about and briefly describe how you would sign the following signs.

Ex.: **TIME**: Touch passive wrist with active index finger, then move active hand back and forth in neutral space with handshape appropriate to time; 1–10, fine; seems to change for 11 and 12.

- a. HEIGHT**
 - b. FIRST, SECOND, THIRD PLACE**
 - c. TV CHANNEL**
 - d. PERIOD OF TIME** (e.g., 6–9 p.m.)
 - e. DOLLAR AMOUNT** (e.g., \$1, \$2)
 - f. NUMBERS ON A SHIRT**
 - g. SPORTS SCORES** (e.g., in racquetball, “I have 9 and you have 11”)
- 2.** “The Snowmobile” on the DVD contains three examples of signs involving numbers. Answer the following questions about these signs.
 - a.** The three signs are:
 - b.** What area do the signs refer to (for example, age, time, etc.)?
 - c.** Are the signs examples of numeral incorporation?

PART
FOUR

SYNTAX

UNIT 14

Introduction

In the phonology and morphology sections, we saw that languages combine smaller units to create larger units. In phonology, the building blocks are individual features; in morphology, the building blocks are units of meaning. Now we turn to *syntax*, where the building blocks are words and signs and the structures we are building are phrases and sentences.

Just as phonology is the study of the rules for combining features and phonemes, and morphology is the study of the rules for combining morphemes, syntax is the study of the rules for combining words to form sentences. Remember that linguistic rules are not *prescriptions* of what is right or wrong, but rather *descriptions* of what users of a language do and do not do, based on scientific analysis.

One of the features of language that makes it distinct from other communication systems is its productivity. The number of sentences that can be produced in a language is infinite, but each language has a finite set of rules for making sentences. Users of a language know these rules and use them to produce new sentences and to understand the sentences used by other people. The set of rules in a language is called *grammar*, and the linguistic study of these rules is called *syntax*.

Sometimes the users of a language cannot explain the rules of their language, but they know when a rule has been broken. They recognize grammatical and ungrammatical sentences. People sometimes make mistakes when they are using their language, and very often they correct themselves as they are using language. But just because they make mistakes does not mean that they do not know the rules. There is a difference between a user's competence in a language and a user's performance in a language. Competence is what a person knows about the language and performance is how the person uses the language. One part of a user's competence is knowledge of the rules for making sentences, or the syntax of the language.

It is important to recognize that theories about syntactic structure are continually developing and evolving. The most currently cited theories include transformational generative grammar (Chomsky 1965, 1981), cognitive grammar (Langacker 1987, 2008), and functional grammar (Dik 1978). The discussion of ASL syntax in this book is based on the work of Scott Liddell (1980, 2003).

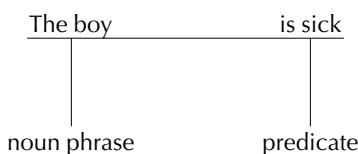
We will start our exploration of syntax with a discussion of the basic sentence types that occur in ASL. Once we have an overall understanding of the ways that sentences are structured, we can take a closer look at the syntactic features that are unique to ASL. The grammatical rules for how signs combine to create sentences are often based on the category of the individual lexical items, so we will introduce lexical categories in unit 16, and then consider the order in which these elements combine to form grammatical sentences in unit 17. Later units will discuss aspect and verb types, and we will conclude this part with a discussion of the many functions of space in ASL, which ties together examples from phonology, morphology, and syntax.

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Basic Sentence Types

Languages have ways of referring to things or activities, and those ways are called *nouns* or *noun phrases*. Languages also have ways of saying something about those nouns or noun phrases, and those ways are called *predicates*. In the English sentence *The boy is home*, *the boy* is the noun phrase and *is home* says something about the boy. In this sentence, *is home* is the predicate. Predicates can have different forms; they are not limited to verbs. In fact, in the English sentence *The boy is home*, the predicate is a verb (*is*) plus a noun (*home*). In the English sentence *The boy is sick*, the predicate is a verb (*is*) plus an adjective (*sick*). We can look at the sentence like this:



Many languages do not use the verb *to be*. In those languages, a predicate may consist of simply a verb, a noun, or an adjective. In ASL, for example, the sentence BOY EAT consists of a noun (BOY) and a predicate, the verb EAT. The ASL sentence BOY HOME consists of a noun (BOY) and a predicate that is a noun, HOME. The ASL sentence BOY SICK consists of a noun and a predicate that is an adjective, SICK. These ASL sentences do not include the verb *is*, but the noun HOME and the adjective SICK function as predicates; they say something about the noun BOY. Verbs, nouns, and adjectives can be predicates in ASL.

In this unit, we will look at some basic sentence types in ASL, focusing specifically on the role that nonmanual signals play in ASL syntax. These six basic sentence types are questions, negations, commands, topicalization, conditionals, and declaratives.

Vocal intonation in English can mark different sentence types. For example, questions have a rising intonation at the end, while declarative statements have a falling intonation. In ASL, this kind of sentence-type marking is done using

nonmanual signals—movements of the face, head, and body that differentiate the different types of sentences and the clause units within them.

When we gloss ASL sentences, we need to be sure to include a written label for the grammatical nonmanual signals as well as the English words we have chosen to represent each sign. The typical way of representing nonmanuals is by writing the label on a line above the glosses with which the nonmanual co-occurs. An alternative method is to enclose the glosses in angle brackets and place the nonmanual label outside the right bracket. We will see examples of the first method throughout this unit as we discuss several of the sentence types used in ASL.

QUESTIONS

Yes-No Questions

Yes-no questions are questions that are answered with either a yes or a no; for example, *Is John home?* When a speaker of English asks a yes-no question, his voice usually rises at the end of the question. This specific vocal inflection is used in English to mark yes-no questions. Yes-no questions in ASL are marked using specific nonmanual signals. When someone asks a yes-no question in ASL, the eyebrows are raised, the eyes are widened, and the head and body may tilt forward; sometimes the shoulders are raised and sometimes the last sign is held (see Figure 31). To represent the nonmanual signal in writing, we draw a line over the signs that are produced at the same time as the face and body are producing the yes-no question nonmanual. The label that goes with the yes-no question nonmanual is *y/n*, so we write *y/n* at the end of that line. An example of a yes-no question is as follows:

y/n
MAN HOME

This sentence would be translated into English as “Is the man home?”

Sometimes yes-no questions in ASL include a sign that is glossed as QUESTION-MARK. These questions are often asked when the signer is surprised by the information she is being given, or when the signer wants to check what the other person is saying. The QUESTION-MARK sign is made with an X handshape with internal move-



Figure 31. Nonmanual signals as part of a yes-no question.



Figure 32. An example of a yes-no question with the sign QUESTION-MARK.



Figure 33. An example of a Wh-question.

ment (wiggling). The resulting emphasis added by the QUESTION-MARK sign conveys unexpectedness. A similar English example would be the sentence *You really think that the test is easy?* (see Figure 32).

Wh-questions

Wh-questions involve the use of the words *who*, *what*, *where*, *when*, *why*, and *how*. Examples of Wh-questions in English are *Where is John?* and *When is class finished?* When a speaker asks a Wh-question, his voice usually goes down at the end of the question. This is the specific intonation that marks Wh-questions in English. Wh-questions in ASL also include the use of the signs WHO, WHAT, WHERE, WHEN, and WHY, and a very specific nonmanual signal. The nonmanual used to mark a Wh-question includes squinting the eyebrows and tilting the head; also, the body may lean slightly forward and the shoulders may be raised (see Figure 33). The label used for a Wh-question is *wh*, so we write *wh* at the end of the line marking the signs that include the nonmanuals. For example, the English sentence *Where is the man?* is glossed as follows:

MAN WHERE
wh



Figure 34. An example of an utterance containing a rhetorical question.

Rhetorical Questions

Sometimes a sentence contains a question that the asker does not really expect the other person to answer. These embedded questions are called *rhetorical questions*. The function of these structures is to provide the connections between related comments. They are called rhetorical questions because while they look like questions, they are not seeking a yes or no answer or any information from the other person. The signer provides both the question and its answer as part of her comment. The label that is used for rhetorical questions is *rh*, and an example of how it is used with a rhetorical question in ASL is as follows:

rh
PRO-1 TIRED WHY STUDY ALL-NIGHT

A literal translation of this sentence could be, “I’m tired. Why? Because I studied all night,” but the overall meaning of the ASL sentence is actually more parallel to the English sentence, “I’m tired because I studied all night.” The question *WHY* functions to connect the two comments, which is similar to the function of *because* and other conjunctions in English.

The nonmanual signal used with rhetorical questions is slightly different than the nonmanuals used with yes-no or Wh-questions. For rhetoricals, the nonmanual includes raised eyebrows and a slight shake or tilt of the head (see Figure 34).

NEGATION

Sentences can be *affirmative* or *negative*. The process of changing an affirmative sentence to a negative sentence is called *negation*. A negative sentence states the opposite of the affirmative statement. For example,

affirmative: The man is home. negative: The man is not home.

In ASL, negative sentences have specific nonmanual signals that include shaking the head from side to side and, possibly, frowning or squinting. The symbol used for glossing negation in ASL is *neg*. An example, which could be translated to English as “The man is not home,” is as follows:

neg
MAN HOME



Figure 35. An example of a negated utterance.



Figure 36. An affirmative grammatical sentence with negative connotation.

The sign NOT is not required in negative sentences and may be used more for emphasis. The nonmanual signal is sufficient to produce a negative sentence (see Figure 35).

It is important to understand that grammatical negation does not mean that the words in the sentence are describing something bad or unwanted. Words that have negative connotations can be used in grammatically affirmative sentences and vice versa. For example, the sign DISGUSTING has a meaning that is understood as bad or negative, but the sentence shown in Figure 36 is grammatically affirmative.

COMMANDS

The sentences that people use to give commands are different from other kinds of sentences. In English, commands (or imperatives) often occur with vocal stress for emphasis, as in *Sit down!* or *Come here!* In ASL, imperatives have particular nonmanual signals, including making direct eye contact with the person being talked to and possibly frowning. An example of an imperative in ASL is *SIT*. The asterisk (*) is used before and after nonmanually marked signs to indicate an imperative.

TOPICALIZATION

Topicalization occurs in ASL when information is expressed at the beginning of the sentence to draw specific attention to it or to emphasize it. Often the topic names

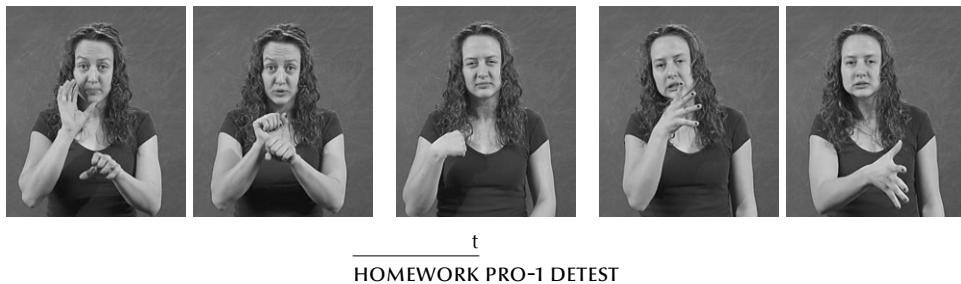


Figure 37. An example of topicalization.

what the rest of the sentence will be about. For example, in the ASL sentence PRO-1 DETEST HOMEWORK, PRO-1 is the subject, DETEST is the verb, and HOMEWORK is the object. If a signer wants to emphasize “homework,” she might produce the sentence with HOMEWORK nonmanually marked as a topic. The topicalized signs are marked by particular nonmanual signals, including raised eyebrows, a head tilt, and, possibly, a short pause. The label used for glossing the nonmanuals of topicalization is *t*, as shown in the following example.

t
HOMEWORK, PRO-1 DETEST

This could be translated literally into English as *Homework, I detest it*; it also could be translated, *As for homework, I really hate it* (see Figure 37).

CONDITIONALS

Sentences with conditionals express an if-then situation. In English, words such as *if* indicate a conditional, and the if-phrase can come at the beginning or end of the sentence. For example, in English you can say *If it rains tomorrow, the game will be cancelled*, or you can say *The game will be cancelled if it rains tomorrow*. In ASL, conditional phrases can begin with #IF and SUPPOSE, but they don’t have to include these signs; it is the use of conditional nonmanual signals that mark the phrase as conditional. These nonmanual signals include raised eyebrows, a head tilt, and possibly a short pause. If the nonmanuals are used, the phrase is conditional, with or without the use of particular signs. The symbol used for conditionals is *cond*, and the English sentence *If it rains tomorrow, the game will be cancelled* is glossed as follows:

cond
TOMORROW RAIN, GAME CANCEL

It is important to note that the second part of the sentence is not conditional. In ASL the conditional phrase is expressed first, and the statement that follows it may be negative or affirmative, a question, or a command (see Figure 38).



Figure 38. An example of a conditional clause in an utterance.

DECLARATIVES

Declarative sentences are statements that convey referential information. As a group, declarative sentences in ASL do not seem to be marked by a nonmanual signal, so when we gloss them, we do not include a line over the signs.

THE IMPORTANCE OF NONMANUAL SIGNALS

In ASL, nonmanual signals, and not the signs, determine the sentence type. The signs of a sentence can be identical, but the nonmanuals make the difference in sentence type. Consider, for example, the signs HOME PRO. These two signs can occur in four different sentence types. The signs themselves are the same; the nonmanuals are different. In each of the following examples, the nonmanual signal is vital in conveying the signer's intended message.

| | | |
|------------------|-------------------|-------------------------|
| Declarative: | HOME PRO | <i>You are home.</i> |
| | <hr/> <i>y/n</i> | |
| Yes-no question: | HOME PRO | <i>Are you home?</i> |
| | <hr/> <i>neg</i> | |
| Negation: | HOME PRO | <i>You aren't home.</i> |
| Command: | *HOME PRO* | <i>Go home.</i> |

SUMMARY

We have seen how different types of sentences are structured and how important nonmanual signals are in ASL syntax. Table 6 summarizes the information on sentence types and nonmanual signals in ASL.

Table 6. Sentence Types and Accompanying Nonmanual Signals

| Sentence Type | Nonmanual Signals | Example |
|-------------------------|--|------------------------------------|
| 1. Questions | | y/n |
| a. Yes-No Questions | Eyebrows raised, eyes widened, head and body may be tilted forward; shoulders may be raised; last sign may be held | MAN HOME |
| b. Wh-Questions | Eyebrows squinted, head tilted; body may be forward; shoulders may be raised | MAN WHERE |
| c. Rhetorical Questions | Eyebrows raised, head may be tilted or may shake slightly | PRO-1 TIRED WHY STUDY ALL-NIGHT |
| 2. Negation | Head shakes side-to-side; may have frown or squint | neg MAN HOME |
| 3. Commands | Direct eye contact with addressee, may frown | *SIT* |
| 4. Topicalization | Eyebrows raised, head tilted, possibly a short pause | t HOMEWORK, PRO-1 DETEST |
| 5. Conditionals | Eyebrows raised, head tilted; possibly a short pause and eye gaze shift | cond TOMORROW RAIN, GAME CANCEL |
| 6. Declaratives | None | PRO-1 DETEST HOMEWORK |

REFERENCE

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Homework Assignment 11

1. Watch the Kansas and Louisiana conversations and the “Brotherhood,” and “House” stories on the DVD and see how many sentence types you can identify. You should be able to find examples of declaratives, topicalizations, negations, and questions. Gloss one example of each.

UNIT 16

Lexical Categories

Now that you are familiar with the basic sentence types used in ASL, we can begin to explore additional aspects of ASL syntax. Before we do this, however, we need to take a look at how signs function in sentences. That is, do the signs function as nouns, verbs, adjectives, or adverbs? These different categories of signs are called *lexical categories*.

Large groups of lexical signs in ASL have very similar properties. These shared characteristics allow us to organize lexical signs into lexical categories. There are two types of signs in ASL. The signs that contribute to the substantive meaning of sentences are called *content signs*, and they include nouns (N), verbs (V), adjectives (Adj), and adverbs (Adv). The other type of signs are *function signs*, and they include pronouns (Pro), prepositions (Prep), and conjunctions (Conj). Content signs are included in the *open* lexical category because new signs can be added to them. In contrast, function signs are a *closed* lexical category because they do not allow new signs to be added.

Each lexical category has a unique set of morphological frames (the position of a sign with respect to the bound morphemes that can be attached to it with a sign) and syntactic frames (the position in which a sign occurs relative to other classes of signs in the same phrase). Both frames of a given sign can be used to determine the lexical category of that sign. The characteristics of the lexical categories in ASL are explained in the following section. Even though there are some universal tendencies across languages in the area of lexical categories, it is important to note that the lexical categories in ASL have unique characteristics that are not applicable to other languages. It is also important to point out that signs can be members of more than one lexical category. A sign's lexical category can only be identified when we see how it is used in a sentence.

OPEN LEXICAL CATEGORIES

Nouns

Noun signs identify entities such as individuals (name signs like DAVID-on-temple, #ANN), places (CHICAGO, #SEARS, #DENNY'S), and concrete and abstract things (COMPUTER, TABLE, THEORY).

Nouns have some common characteristics that can be used to identify them. One is whether or not they refer to things that can be counted. While many English nouns form the plural by adding the bound morpheme *-s* (*door/doors*), noun signs in ASL tend to occur only in the syntactic frame. That is, unlike English nouns, it seems that there are no bound morphemes that attach to nouns in ASL to pluralize or to otherwise modify them. A small number of ASL nouns form the plural by *reduplication*. That is, the noun is repeated two or three times in an arc or linear movement path. Some examples of noun reduplication are BROTHER++, SISTER++, WORD++, TREE++, and PLANT++. Most nouns, however, cannot be reduplicated. Another characteristic of nouns is that they can be modified with descriptive signs (adjectives). This will be explained later in the section on adjectives.

Verbs

Verb signs are actions, events, processes, and states of being: RUN, WALK, ENJOY, LIKE, HELP, INFORM. ASL has a dynamic verb system that will be explained in unit 19.

Adjectives

Adjectives are signs that describe nouns. Adjectives can describe an opinion, size, age, or color, among other qualities of a noun, and they usually appear before the noun. Figure 39 contains examples of adjectives paired with nouns.

Adjectives in ASL can also function like a verb or *adjectival predicate*. For instance in the sentence <MOVIE>t FUNNY, the adjective follows the noun and acts as a verb (see Figure 40). English adjectives can function in a similar way, except that they are used with a form of the verb *to be*, as in *That movie is funny*.

Adjectives can also be modified. The difference in meaning between TALL MAN and VERY-TALL MAN is that the first sentence describes a tall man and the second sentence describes a man who is very tall. The example on the left side of Figure 41 shows that the sign TALL is a two-handed sign in which the active hand moves from the base to the fingertips of the passive hand. When the sign begins well below the passive hand, brushes it, and ends above the fingertips, along with a marked facial expression, the sign can be glossed VERY-TALL (see right side of Figure 41).

Adverbs

Adverbs are signs that are used to express manner, indicate temporal frequency, or modify adjectives and other adverbs. English marks adverbs most often (although not always) by adding the suffix *-ly* to a word (*quick/quickly*). ASL signs are modified in a different way to express adverbial information. The articulation of a sign (how it

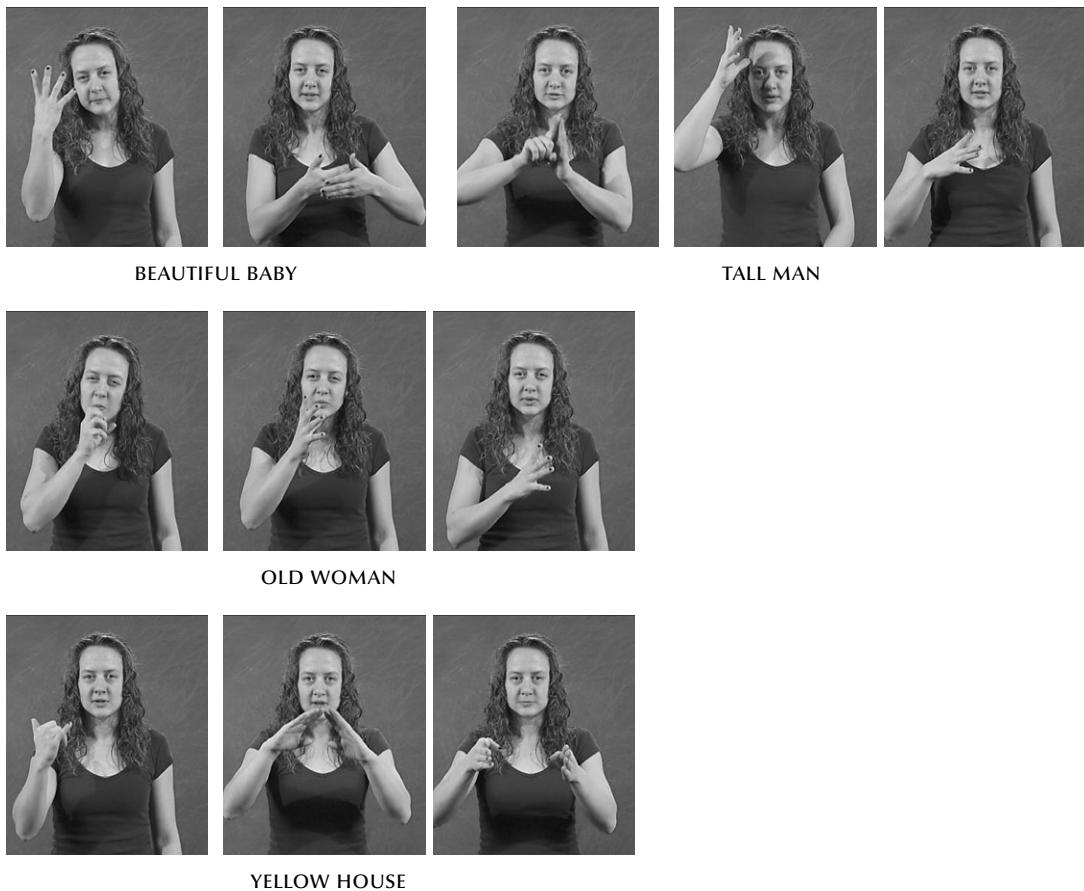


Figure 39. Examples of adjectives paired with nouns.



Figure 40. An ASL adjective functioning as a predicate.

is produced) can be altered and a nonmanual signal added, as in <CHILD>*t* SIT-FOR-LONG-TIME (see Figure 42). The sign SIT is produced with a repeated arc while the signer simultaneously puffs her cheeks. This sentence conveys the meaning that the child sat for an extended period of time.

Adverbs can also indicate when an action or event took place—YESTERDAY, TWO-WEEKS-AGO, NEXT-TWO-DAYS, and STILL. They tend to occur at the beginning of a sentence. Figure 43 shows a sentence with this syntactic frame.

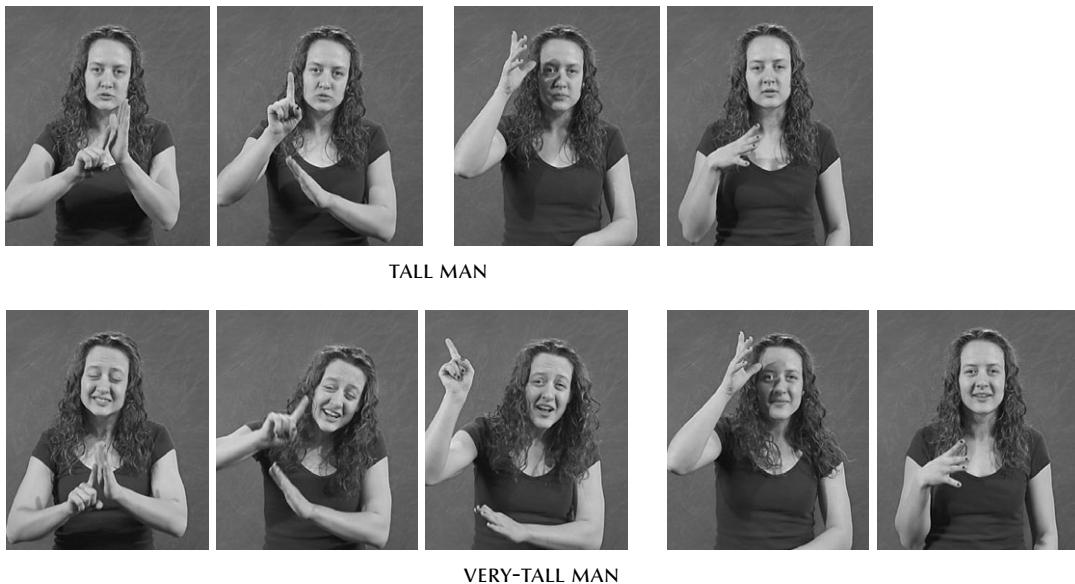


Figure 41. An example of adverbial meaning incorporated into an adjective sign.



Figure 42. An example of altering the articulation of a sign accompanied by a nonmanual signal.

CLOSED LEXICAL CATEGORIES

The members of closed lexical categories often are used to relate various types of phrases to other phrases. They have little meaning outside of their grammatical purpose. These groups consist of pronouns (Pro), modal verbs (Mod), prepositions (Prep), and conjunctions (Conj).

Pronouns

A pronoun represents a person, place, or thing that has already been identified in a sentence. Languages vary in what information their pronoun systems encode (gender, number, person, case). Examples of pronouns in English are *he*, *she*, *it*, *them*, and *us*. Examples of English sentences with pronouns are *He came home early* and *She gave it to us*. When reading or hearing those sentences, we must know to what or to whom *he*, *she*, *it*, or *us* refers. If we do not know, we cannot understand the sentence. We understand the sentence because the referent (the noun that the pronoun represents) has been introduced earlier in the conversation or because we guess from the context. For example, if one sentence describes *the boy* and the next sentence uses the



Figure 43. An adverb indicating when an event will occur.



Figure 44. First- and nonfirst-person pronouns in ASL.

pronoun *he*, it is safe to assume that the pronoun *he* represents *the boy*. Or suppose three people are seated at a table. If one person looks at the person on her right and points to the person on her left and says *He told me something interesting*, the meaning of *he* comes from the context, and we can assume that *he* refers to the person on the left.

ASL also has pronouns, but its pronoun system differs from English in a number of ways. The first difference is that ASL only has first-person (PRO-1) and nonfirst-person pronouns (PRO) while English has first- (*I/me*), second- (*you*), and third-person (*he/him, she/her, it*) pronouns. For example, the ASL sentence PRO-1 PUNISH PRO has two pronouns, one that points toward the signer and usually contacts the chest (glossed as PRO-1), and one that points away from the signer (glossed as PRO). The English translation of this sentence could either be “I punished you” or “I punished him,” depending on where the signer was looking. Both sentences use the same ASL sign, PRO because there is not a distinct form separating second- and third-person pronouns (see Figure 44).

ASL and English also differ in how they distinguish between subject and object pronouns. English uses different words—*he* (subject pronoun) and *him* (object pronoun), *we* and *us*, *she* and *her*, *they* and *them*, and so forth. ASL pronouns, like the pronouns in many other languages, do not show this distinction. Instead, subject and object are indicated in the sequence of signs. For example, if the initial and final signs in Figure 45 were reversed, the meaning would change.

One similarity between ASL and English is that both languages distinguish between singular and plural pronouns. For example English speakers can say *I want a drink* or *we want a drink*, depending on how many people are thirsty. ASL makes the same distinction (PRO and PRO-PL). Compare the sentences in Figure 46.



Figure 45. Distinguishing between subject and object pronouns in ASL.

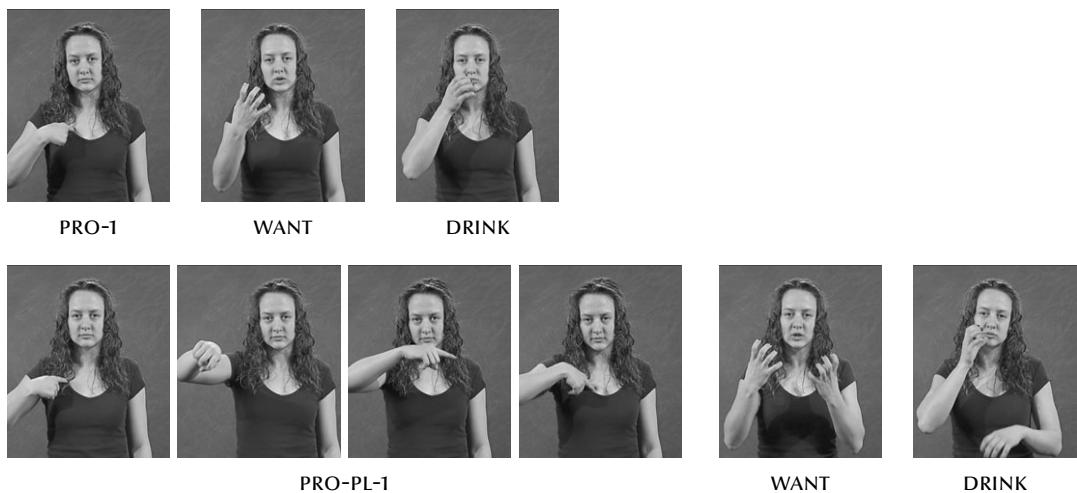


Figure 46. Distinguishing between singular and plural nouns.

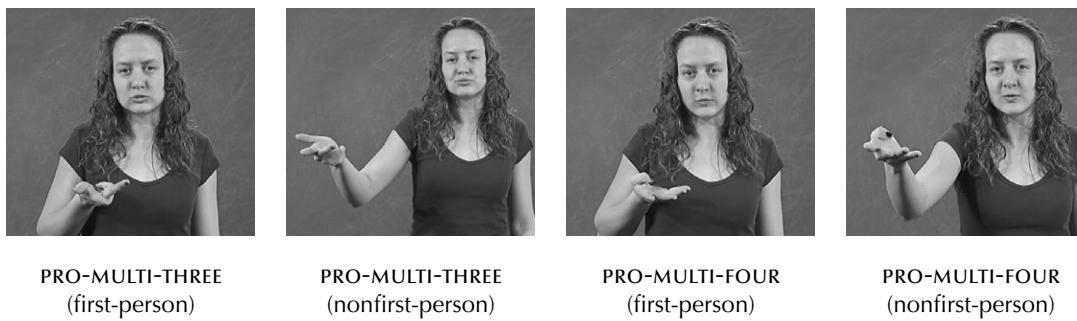


Figure 47. Pronouns specifying number.

In addition, ASL has pronouns that are produced with numeral morphemes. This allows the pronouns to identify a specific number. These pronouns are produced with a horizontal circular motion, as can be seen in Figure 47. English can express the same concept that these ASL signs do, but it requires a phrase rather than a single pronoun, *the three of us* or *the four of us*. Table 7 summarizes the pronoun system described in this section.

Table 7. The Pronoun System in ASL.

| First-person Examples | | Nonfirst-Person Examples | |
|-----------------------|---|--------------------------|--|
| PRO-1 |  | PRO |  |
| PRO-DUAL-1 |  | PRO-DUAL |  |
| PRO-MULTI-THREE |  | PRO-MULTI-THREE |  |
| PRO-MULTI-FOUR |  | PRO-MULTI-FOUR |  |
| PRO-MULTI-FIVE |  | PRO-MULTI-FIVE |  |
| PRO-PL-1 |  | PRO-PL |  |



Figure 48. Examples of modals.

Modal Verbs

Modal verbs like WILL, CAN, MUST, and SHOULD express the idea of necessity or possibility. Modal verbs are produced with other verbs; the modal comes first, followed by the main verb. Occasionally the modal is also repeated after the verb for emphasis. Figure 48 illustrates some examples in the syntactical frame.

Emphasis can be added to modal verbs by incorporating nonmanual signals. For example, the difference between *should*, *need to*, and *absolutely must* can be conveyed by the intensity of the nonmanual signal. The last example in Figure 49 playfully shows intensity by the use of all four fingers in the sign MUST.

Prepositions

Prepositions (Prep) show relationships between nouns and predicates or pronouns. English has many words to express these relationships (e.g., *under*, *on*, *in*, *above*, *with*, and *to*). In ASL these relationships are typically expressed through depiction, indicating and depicting verbs, and the index finger pointing to mean “at.” Compared to English, ASL does not have many independent prepositions, but it does use some signs—IN, UNDER, and BEHIND. However, these signs have a different function in ASL in that they typically incorporate more information than English prepositions do. Signs including prepositional information often function as predicates. For example, when the sign INSIDE is produced on the chest with repeated



nodding
PRO-1 MUST EAT



nodding
PRO-1 MUST EAT



nodding
PRO-1 MUST EAT



nodding
PRO-1 MUST EAT

Figure 49. Use of nonmanual signals to intensify modals.

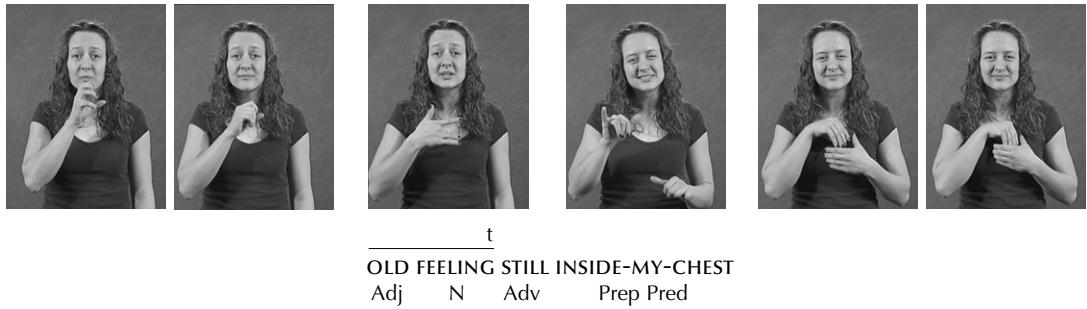


Figure 50. An example of prepositional predicate.



Figure 51. Examples of conjunctions.

movement to talk about inner feelings, it becomes the predicate of the sentence (see Figure 50).

Conjunctions

Conjunctions join words or phrases of the same category. ASL conjunctions include BUT, UNDERSTAND, #OR, and PLUS. Examples of conjunctions in the syntactic frame are shown in Figure 51.

SUPPLEMENTAL READING

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Homework Assignment 12

1. Watch the Kansas and Louisiana conversations on the DVD. Gloss two sentences from each conversation and explain how you know that they are sentences. For example, what is it about the signs and the non-manual features that tells you where a sentence begins and ends?
2. Think of two ungrammatical (unacceptable) sentences in ASL and explain why they are ungrammatical.
3. Find one example of someone self-correcting while signing. How does the person indicate that he is correcting himself? What is the mistake?
4. Using your gloss of "The Snowmobile," identify the lexical category of the signs in the first five sentences.
5. Look at your gloss of "The Snowmobile" and see how you would improve it based on what you know now about the structure of sentences in ASL.

UNIT 17

Word Order

In Unit 16 we introduced lexical categories in ASL. The lexical category determines how a sign can combine with other signs to create phrases or sentences. The way a language chooses to organize lexical categories in phrases or sentences is called *word order*. In this unit, we will outline the most common word orders used in ASL.

Sentences can be divided into specific parts. The *subject* (S) is the person or thing that is the primary actor or agent in a sentence. The *verb* (V) is the action, process, or state that occurs in the sentence. The *object* (O) is the person or thing that receives the action. The order in which these occur varies across languages, but the most common word order is SVO. Forty-four percent of the world's languages primarily use SVO order. Both English and ASL have SVO word order as the basic or most neutral order in main clauses.

BASIC WORD ORDER IN ASL

As we just said, in main clauses in ASL the basic word order is Subject-Verb-Object (SVO). This structure may be used with *transitive* verbs or verbs that allow objects. Take for example the English sentence *The father loves his child*, or its ASL equivalent, FATHER LOVE CHILD. The word order in both sentences is SVO. The same word order is used whether pronouns or nouns are used in the sentence. For example, during the course of a conversation, non-first-person pronouns (glossed as PRO) may be used to refer to the father and the child (see Figure 52).

Additions to this basic word order for main clauses can be made outside the main clause through subject pronoun copy and topicalization. The additions are marked with nonmanual signals such as raised eyebrows, head nods, etc. Even when these additions occur, the main clause order is still the same; the subject will always come before the verb, and the object will always come after the verb.

Subject Pronoun Copy

One potential addition to the main clause is called *subject pronoun copy*. This occurs when a signer uses a pronoun after the main clause to refer back to the subject.



Figure 52. Basic word order in ASL.



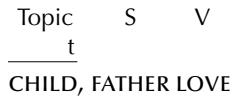
Figure 53. An example of subject pronoun copy.

For example, as shown in Figure 53, the pronoun copy PRO refers to the subject of the sentence, the father.

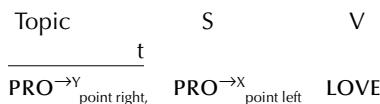
Topicalization

In Unit 15, we introduced sentences with topicalized components. Topicalization occurs when information is expressed at the beginning of the sentence to draw specific attention to it or set it up as prominent, and it results in an adjustment to the basic word order. Often the topic names what the rest of the sentence will be

about. The topic, or prominent information, is signed before the main clause of the sentence and is accompanied by a nonmanual signal. The nonmanual signal used in topicalization is raised eyebrows, slight forward head tilt, and a possible short pause. The use of topicalization allows for structures like the following to occur:



The sign CHILD is the topic, and the signer makes a comment about the child. As we saw before, this same sentence can occur with pronouns instead of nouns, as follows:



The direction where the signer points for PRO provides information about who is being referred to (see Figure 54).



Figure 54. An example of topicalization.

Subject and/or Object Omission

Within the main clause, ASL allows signers to omit the subject and/or object in certain situations. Signers may choose not to express the subject or object when people in a conversation understand it from earlier statements in that conversation. For example, in response to a question about where the dog is, a signer might answer with PRO-1 SEARCH+; CAN'T FIND. The first clause includes a subject and a verb, but the object, which is understood to be *the dog*, is omitted. In the second clause, both the subject (now understood as I) and the object (still understood as *the dog*) are omitted (see Figure 55).

Subject and/or object omission in main clauses can occur even with topicalization or subject pronoun copy. For example, the subject may not be signed, and a subject pronoun copy may still be used to refer to the understood subject. A signer might use the following structure:

LOVE CHILD PRO \xrightarrow{x}
point left

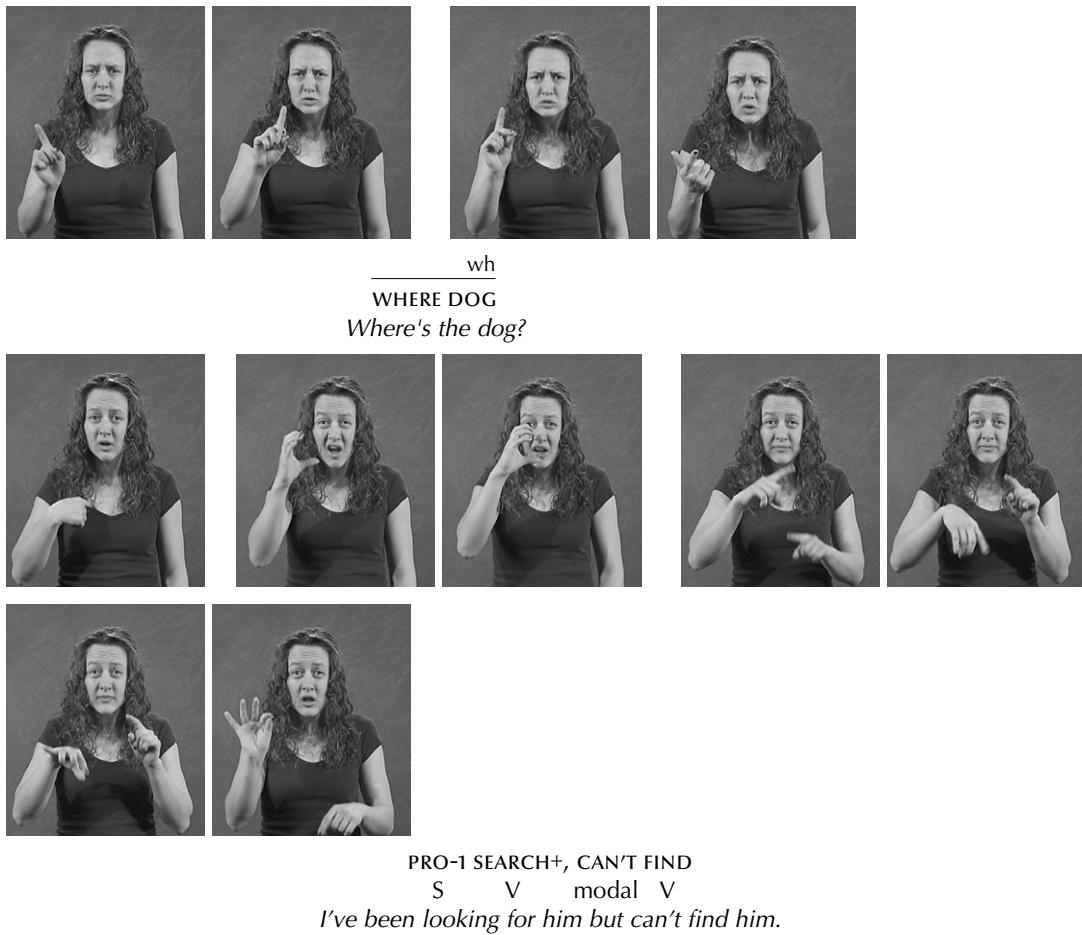


Figure 55. An example of subject and object omission.



Figure 56. An example of pronoun copy with subject omission.

In this example, we know from the earlier context that $\text{PRO}^{\rightarrow X}_{\text{point left}}$ refers to the subject, which is understood to be the father (see Figure 56).

WORD ORDER WITH INTRANSITIVE VERBS

Verbs or predicates that do not allow objects are called *intransitive verbs*. The basic word order for an ASL main clause with an intransitive verb is Subject-Verb (SV), as in BOY SILLY. In this case, the subject is a noun, but it could also be a pronoun. The English sentence *He is silly* would be signed in ASL as PRO SILLY. The pronoun in this case is represented by the index finger pointing in the direction of the space already established as referring to that person, often with eye gaze accompanying the pointing. Once you understand this type of sentence, it is easy to think of other intransitive predicates, such as FUNNY, BEAUTIFUL, SMART, and UGLY.

As with transitive verbs, intransitive verbs can be used in main clauses with additions and with subject omission. When subject pronoun copy is added, the complete word order structure is Subject-Verb-Pronoun copy (SVPro), where the pronoun copies the subject and is accompanied with head nodding (nd). This can be written as follows:

nd
S V Pro

An example of this structure is demonstrated in Figure 57, which can be written as

nd
BOY SILLY PRO^{→X}_{point left} (subject pronoun copy)

This same structure can also be used when the signer chooses to omit the subject, resulting in an utterance that is Verb-Pronoun, where the subject is understood and the subject pronoun copy includes head nodding.

nd
V Pro

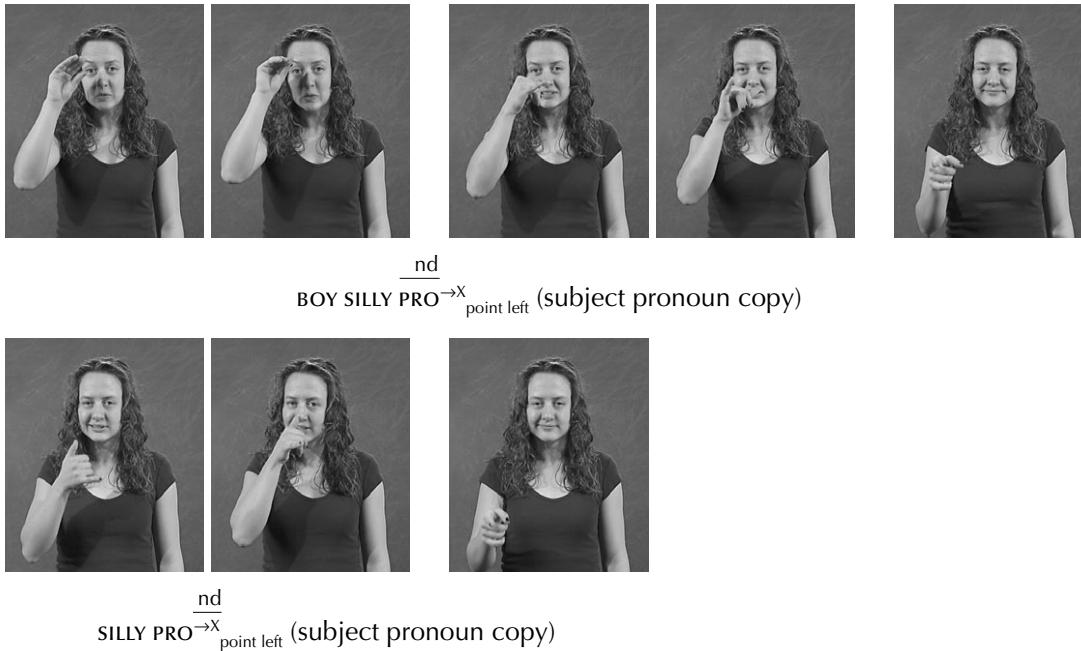


Figure 57. Sentences with intransitive verbs can include subject pronoun copy and subject omission.

The sample sentence then becomes

$\overline{\text{nd}}$
SILLY PRO \rightarrow^X _{point left} (subject pronoun copy)

Like spoken languages, ASL does not permit certain sentence structures. In ASL, the subject cannot follow the verb. Therefore, the sentence *silly boy (*VS) is ungrammatical in ASL (the asterisk in front of the sentence indicates that the sentence is not acceptable in ASL).

SUMMARY

This unit introduced the word order of ASL sentences. The most important points can be summarized as follows.

1. The basic word order of ASL sentences with transitive verbs is Subject-Verb-Object. The basic word order of ASL sentences with intransitive verbs is Subject-Verb.
2. When additions to the main clause are included, they are marked in some way. For example, if the subject is repeated as a pronoun after the main clause, the repetition will be accompanied by nodding. If topicalization is used before the main clause, the eyebrows are raised, the head is tilted, and there may be a slight pause before the rest of the sentence is signed.

3. The following chart lists the word orders that are acceptable in ASL sentences.

| Topic | Main Clause | | | Subject Pronoun Copy |
|--------|-------------|-------|--------|----------------------|
| | Subject | Verb | Object | |
| | DOG | CHASE | CAT | |
| | DOG | CHASE | | |
| | | GIVE | | |
| | DOG | CHASE | | <PRO>nd |
| | | HAPPY | | <PRO>nd |
| <DOG>t | | CHASE | CAT | |
| <DOG>t | | CHASE | CAT | <PRO>nd |
| <CAT>t | DOG | CHASE | | <PRO>nd |

Homework Assignment 13

1. Apply object topicalization and subject pronoun copy to the following SVO sentences. What new word order do you get?

KID LOVE PIZZA

PRO-1 LOSE PAGER

2. What changes to the basic word order are applied in the following sentences, and in what order (i.e., topicalization, subject pronoun copy, subject and/or object omission)?

TERRIFIED PRO-1

I'm terrified!

<TEST>t, FAILED PRO-1

The test, I failed it!

UNIT 19

Verbs

The function of verbs in a language is to encode meaning related to action and states. There are three main categories of verbs in ASL: *plain*, *indicating*, and *depicting*. Liddell (2003a, 2003b) first introduced the terms *indicating* and *depicting verbs*. We have found them valuable for describing the different types of verbs in ASL. All linguists do not use this terminology, however. In particular, depicting verbs have been referred to as *classifier predicates*, and the handshapes associated with certain classifier predicates are called *classifier handshapes* (Supalla 1978).

PLAIN VERBS

Plain verbs are produced in a static location that cannot be altered without changing the meaning of the sign. The location feature is simply a part of how the sign is made, making the function of the location merely articulatory. In these signs, location does not have independent meaning. Similarly, plain verbs do not contain information about the subject or object of a sentence. Examples of plain verbs include EAT, ENJOY, FORGET, HAVE, LIKE, LOVE, PUNISH, and UPSET (see Figure 68).

INDICATING VERBS

Indicating verbs are more dynamic than plain verbs. They move toward specific people, objects, or spatial locations, and in doing this, they incorporate additional information about the subject and object of the sentence. Generally, these signs move from the signer toward a person or location or from the person/location to the signer. Examples of indicating verbs include GIVE, INFORM, TELL, PICK-ON, SEND, and PAY (see Figure 69). The example illustrated in Figure 70 shows how the sign GIVE can mean either *I give to you* or *you give to me*, depending on the starting and ending locations of the sign.

The orientation of the indicating verb can also contribute information about the subject and object of the sentence. With the sign HATE (the form made with an 8 handshape), the palm faces the entity detested and the back of the hand faces the

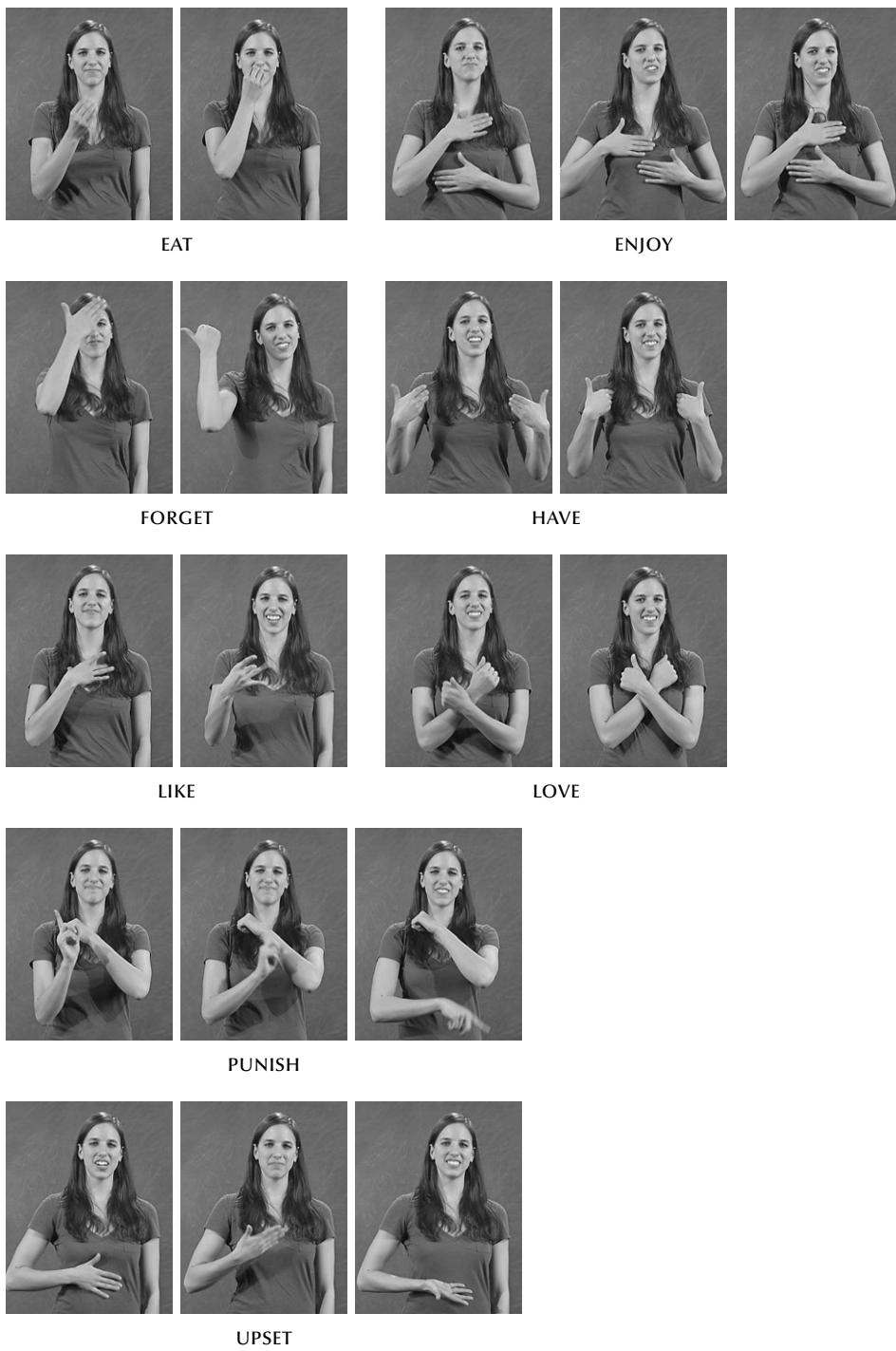


Figure 68. Examples of plain verbs.

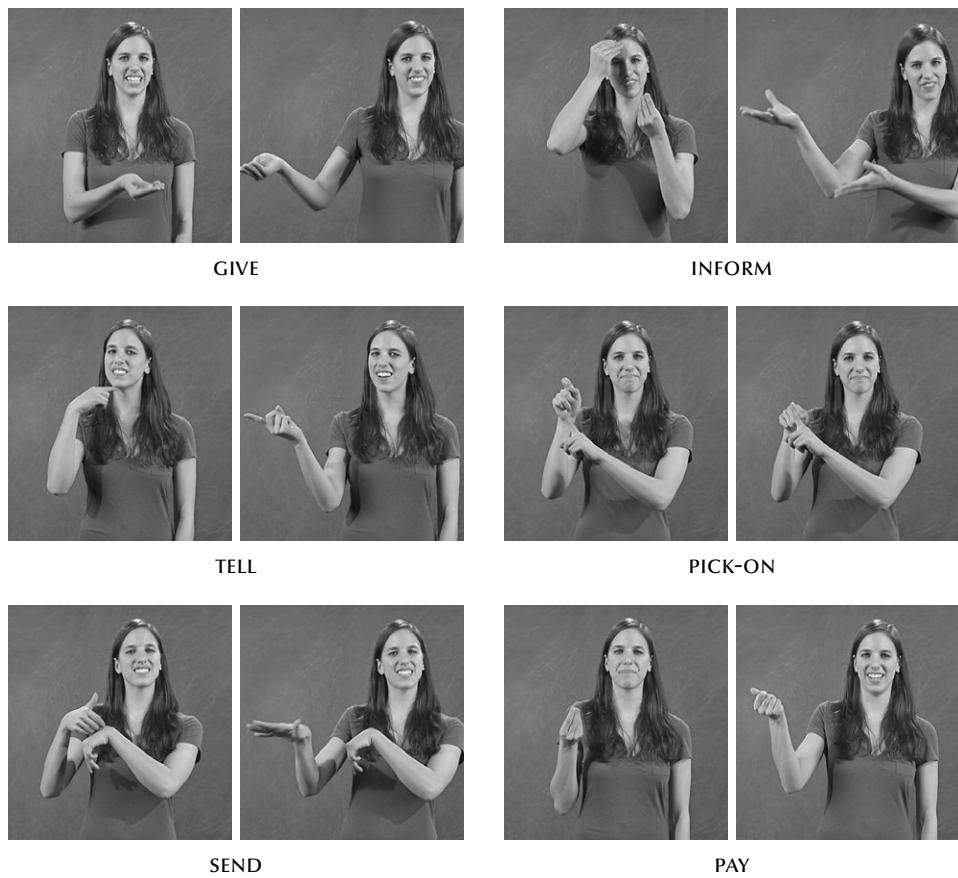


Figure 69. Examples of indicating verbs.



Figure 70. Subject and object information contained in the location of an indicating verb.

entity that is doing the detesting. In the ASL translation of the English sentence *I hate him*, the back of the hand faces the signer and the palm faces the location where the hated person has been established. Separate signs for *I* and *him* are unnecessary because the direction of the verb contributes this information. In the sentence *He hates me*, the situation is reversed (see Figure 71). For some verbs like



Figure 71. Subject and object information contained in the orientation of an indicating verb.



Figure 72. Subject and object information contained in the location and orientation of the indicating verb.

INVITE and HIRE, the first location of the verb is related to the object and the second location refers to the subject.

Orientation and location may be combined to contribute information about the subject and object. The ASL verb #SAY-NO-TO can be used to express the English sentence *I say no to him*. The signer would begin the sign near his or her body, with the palm facing the other person's location, and then the hand would move in the direction of the other person. To convey the meaning in the English sentence *He says no to me*, the orientation and beginning and ending locations of the verb #SAY-NO-TO are reversed. In this articulation, the sign would begin in the location of the other person and the palm of the hand would face the signer; the sign would end near the signer (compare the signs in Figure 72).

Indicating verbs can also add information by showing reciprocating action. These verbs are called *reciprocal verbs*. In a situation in which two people are looking at each other, they both are looking and being looked at simultaneously. The indicating verb LOOK-AT-EACH-OTHER captures this situation. Each hand represents a person. The fingers of the right hand point directly at the fingers of the left hand, thus showing how each person is surveying the other with their eyes. Another example of a reciprocal indicating verb is UNDERSTAND-EACH-OTHER. In this verb, one hand is placed near the signer's forehead, with the palm facing out. The location of the hand represents the signer, and the orientation points toward the person with whom the signer is conversing. The second hand is on the same level as the first



Figure 73. Two examples of reciprocal verbs.



Figure 74. The direction of locative verbs reveals specific information.

hand, with the palm facing the signer. The location of the second hand represents the other conversant. Each hand represents a person, and the fact that the palms are facing each other indicates that the signers comprehend what the other is saying (see Figure 73).

Locative verbs are another type of indicating verb. Locative verbs are different from plain verbs like ENJOY, PUNISH, or UPSET, in which the location feature is simply a part of how the sign is made. The function of the location in plain verbs is articulatory; the location does not have independent meaning. With locative verbs, the actual direction or location of the sign contains specific meaning. A good example of a locative verb is THROW. When a signer signs the sentence JOHN THROW → ROCK, the direction of the sign indicates the direction in which the object is thrown (in this case, away from the signer towards some location). The direction of the sign can vary, depending on the meaning the signer wants to convey. If the signer is talking about throwing something upward, like shooting a basketball, the direction of the sign is upward; if the signer is talking about throwing something into a trash can, the direction is downward (see Figure 74).

Other locative verbs include the sign HURT and the fingerspelled sign #HURT, in which the location shows the specific area of the body that hurts. While the location or direction of a locative verb represents a place in three-dimensional space, the handshapes of these signs do not have independent meaning. The best way to illustrate the difference is to compare the locative verb #HURT and the depicting verb USE-SCALPEL (see Figure 75). While we would say the handshape in USE-SCALPEL



USE-SCALPEL

Figure 75. The difference between locative and depicting verbs.

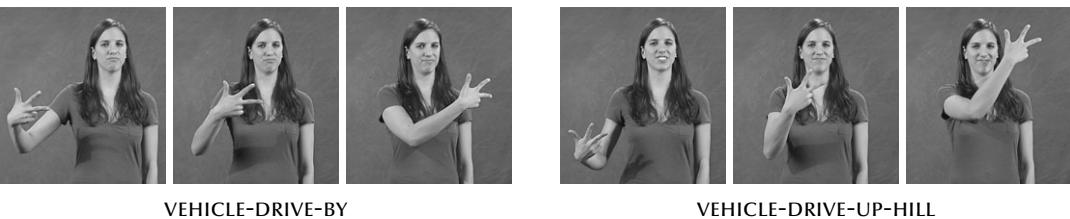


Figure 76. Depicting verbs showing the movement of a car.

is related to a hand holding a scalpel, the handshapes of #HURT do not contribute additional meaning.

DEPICTING VERBS

The final category of ASL verbs is *depicting verbs*. What distinguishes this category of verbs is their ability to convey two types of information. Depicting verbs, like other verbs, contain information related to action or state of being. Additionally, the forms of depicting verbs represent aspects of their meaning. In the past, many of the verbs in this category were labeled classifier predicates (see box). Examples of depicting verbs include VEHICLE-DRIVE-BY, PERSON-WALK, FLAT-SURFACE, VEHICLE-DRIVE-UPHILL. The examples in Figure 76 show the movements of a car. In the first sign, the car is being driven on a flat surface and in the second sign the car is being driven up a hill.

One way to describe how the form of depicting verbs represents aspects of their meaning is through *blending* (Liddell 2003a). The concept of blending is not limited to signed languages; it is part of the general way that people conceptualize and make sense of information. For example, if two people were sitting in an office having a conversation, and one wanted to describe the street where she lived, she might set up objects on the desk as a visual representation of her street. She might use a book to represent her house, a folder to represent her neighbors' house, and a pen to represent the railroad tracks at the end of the street. Each of these real items present on the desk would be understood to represent part of the imagined “scene” of the street.

Changing Terminology

In the introduction to this book we explained that linguistics is the scientific study of languages and that science is a process for gaining knowledge. Often our initial explanations of a phenomenon are not accurate and are refined through systematic analysis. In the late 1970s the term *classifiers* was introduced to describe structures noticed in spoken languages. The definition and one proposed classifier type (predicate classifiers) introduced by Allan (1977) seemed to help explain some structures found in ASL. Sign language linguists adopted the term *classifier predicate* to describe certain types of signs in ASL. However, in the mid-1980s sign language researchers began arguing against the label (Engeberg-Pedersen and Pedersen 1985; Brennan 1986).

By the mid-1990s spoken language researchers had significantly redefined classifiers in spoken languages based on the analysis of many languages. The new definition proposed by Grinevald (1996) no longer adequately described the structures found in ASL, especially signs that express motion, location, handling, and description. Sign language researchers have proposed several labels for describing these types of signs: *polycomponential verbs*, *polymorphemic verbs*, and *depicting verbs*. We have selected *depicting verbs* as this seems to offer the best description of how these signs function.

This brief review helps explain why we no longer use the label *classifier predicates* to describe certain signs and are now referring to them as *depicting verbs*. It is quite possible that in ten or twenty years, after additional systematic analysis of the language, an even more accurate label will emerge. That is why linguistics is so exciting—we are always expanding our knowledge about a language.

Since ASL is a visual language, ASL users take advantage of this same type of conceptual blending by using the fingers, hands, arms, body, and face as the real “objects” representing scenes. To describe a rocket taking off into space, one could use a pen placed on end moving upwards from the surface of the desk; in ASL, signers use a 1 or R handshape instead of the pen. The handshape represents the shape and orientation of the rocket, while the locations of the hand in signing space represent where the rocket is traveling, and the style and direction of the sign’s movement represent how the rocket is moving (quickly, jerkily, bouncing, arcing, etc.). Thus, all the features of the form of the sign represent aspects of the event the verb describes through blending.

The choice of how to depict an event or thing in a blend includes what size and shape will represent it most effectively based on what one is trying to communicate. For example, a signer has several ways to show a person walking: by pointing the index finger up to represent a whole person and moving the finger across the signing space; by pointing two fingers down to represent the person’s legs and alternatively moving the fingers forward as the hand moves; or by bending the arms at the elbows and swinging them while rhythmically bouncing the shoulders and head to represent the person’s upper body while walking (see Figure 77).

Depicting verbs can be divided into three main types. The first type is used to show where something is in space. Suppose a person wants to share a story about a car ride. The narrator would begin by establishing the fact that he has a car. This

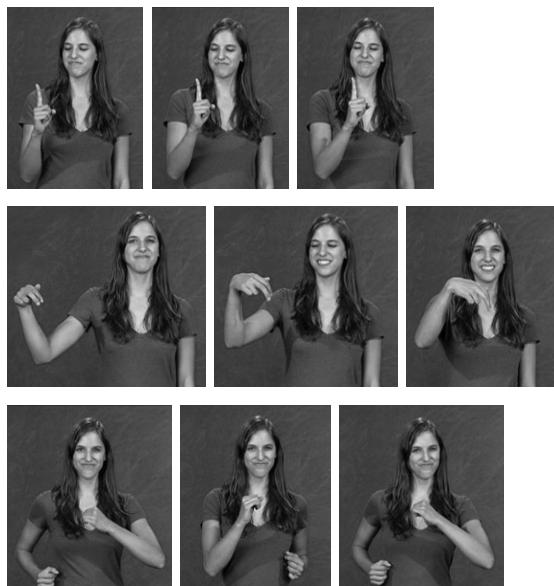


Figure 77. Three possible ways to depict a person walking.

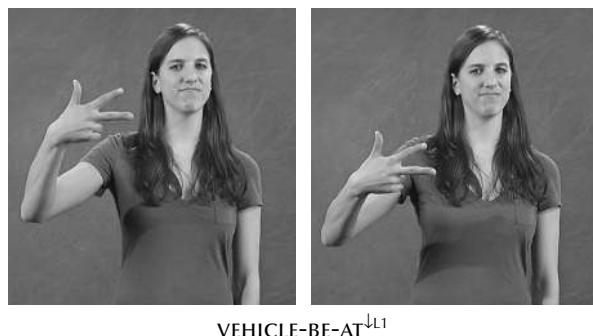


Figure 78. A depicting verb showing location in space.

is accomplished by using a depicting verb to locate the car in space. The verb is made with a short downward movement followed by a hold, and it is transcribed as VEHICLE-BE-AT^{↓L1} (see Figure 78). The superscript $\downarrow L1$ indicates that this depicting verb is placing an entity at a specific location using a downward movement.

The second type of depicting verb shows what something looks like, how it is shaped, or how objects are arranged. Returning to the story about the car ride, the narrator may want to describe the steep mountain that he traveled up. A depicting verb showing the mountain surface could be used. This type of depicting verb differs from the first in that one hand is kept stationary while the second moves away from it. The movement of the second hand shows the steepness of the hill the driver climbed, and it can be expressed as FLAT-SURFACE-EXTEND-UPWARD^{↓L1-L2}. The superscript $\downarrow L1-L2$ means that the sign moves from a starting location to an ending location. This type of verb is dynamic in that it can provide two types of information.

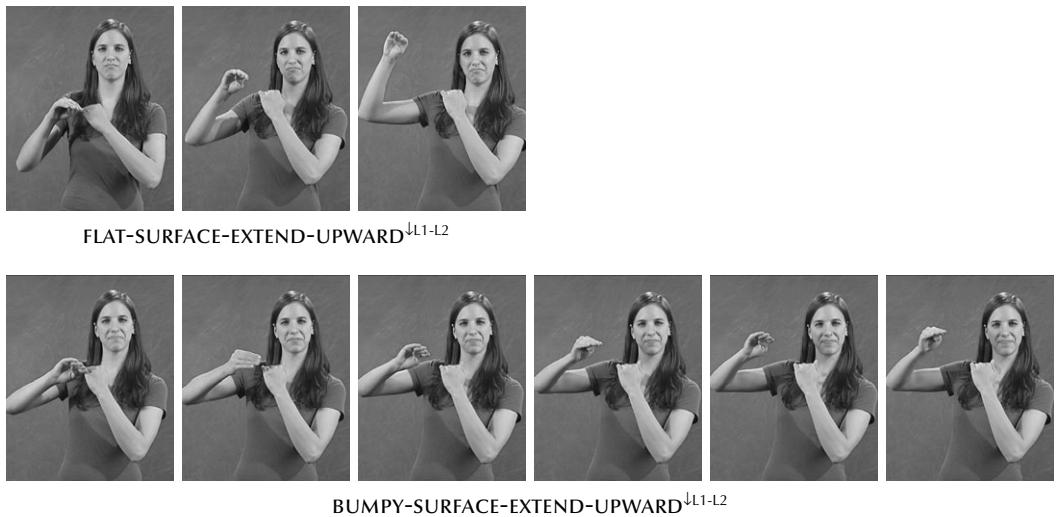


Figure 79. Depicting verbs can fully describe an object.

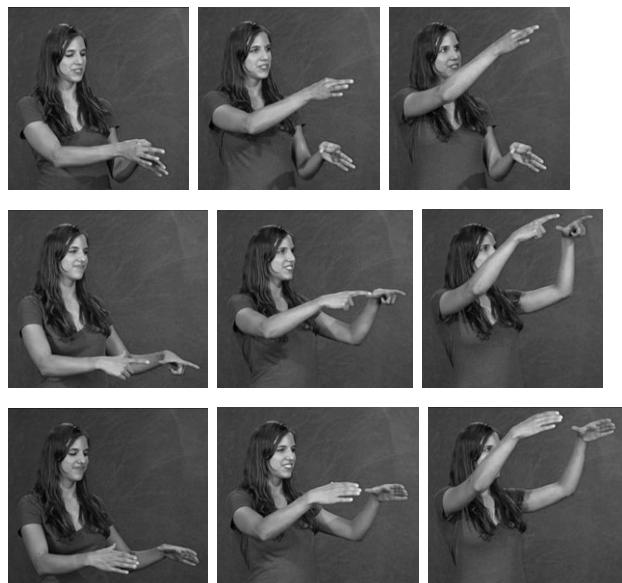


Figure 80. Depicting the size and shape of columns.

tion—what the surface looks like and where it extends. If the driver came to an unpaved portion of the road, the sign could be altered to reflect this (see Figure 79).

Signers also use this second type of depicting verb to describe how things look, including different sizes and shapes. The three examples in Figure 80 all depict columns. The different handshapes represent three different sizes of column, either actual different sizes or differences based on perspective.

The third type of depicting verb shows movement or action. Continuing the example of the narrator talking about his car, he would sign VEHICLE-DRIVE-TO^{↓L1-L2}

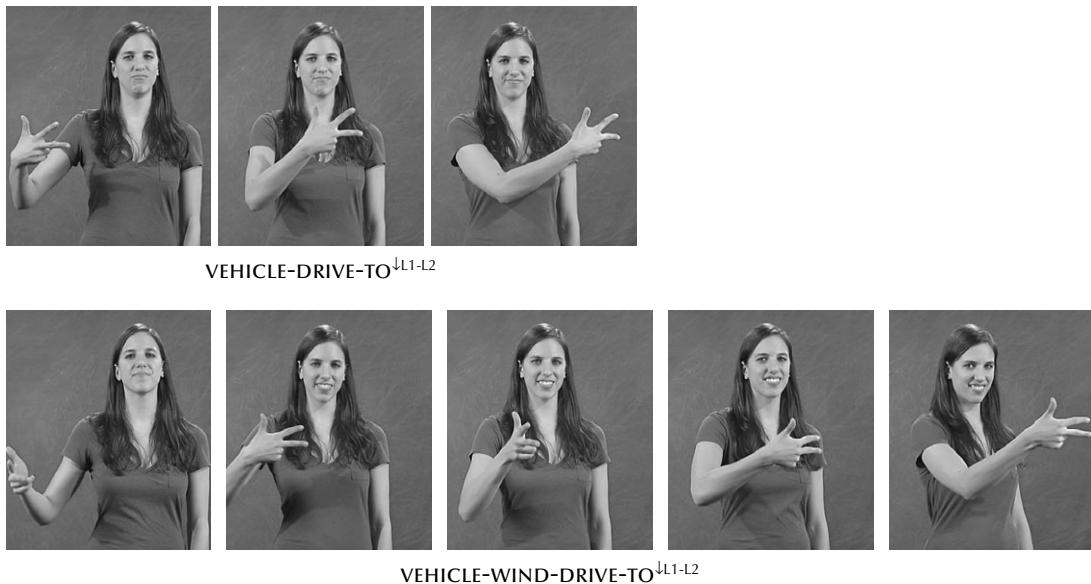


Figure 81. Depicting verbs showing the movement of a car.



Figure 82. Depicting a person drinking from a teacup.

to indicate that the car moved from point A to point B. As was the case with the second type of depicting verb, this third type can also reflect the path of the motion. If the car traveled on a winding road, the signer could express this as VEHICLE-WIND-DRIVE-TO^{↓L1-L2} (see Figure 81).

This category of depicting verbs, those that show action, includes depictions in which signers use the whole upper body—hands, arms, face, etc.—to represent people's actions. The example discussed earlier of ways to depict a person walking (Figure 77) falls into this category. Other examples include signs depicting people holding and using objects, such as drinking from a teacup, as shown in Figure 82.

Some depicting verbs have been used widely and consistently over time in the Deaf community, to the point that they have become *lexicalized*. That is, they have assumed a meaning that is separate from the morphemes that make up the sign. They can function like plain verbs or as nouns in ASL utterances. For example, the sign KEY is clearly based on the depiction of a key being placed into a lock and



Figure 83. Depicting a person opening a door with a key.



<PRO-1.poss KEY WHERE>wh
Where is my key?

Figure 84. The noun KEY lexicalized from a depicting verb.

turned. One can express the action as a depicting verb, or the form can be used as a lexicalized noun in a sentence like <PRO-1.poss KEY WHERE>wh, meaning “Where is my key?” (See Figures 83 and 84.) Other examples of depicting verbs that have become lexicalized include DRINK, PACK, and FUNERAL. ASL also has some lexical signs that are understood based on metaphorical depiction, such as FALL-IN-LOVE and TRUST.

SUPPLEMENTAL READINGS

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 “Body Partitioning and Real-space Blends,” by Paul G. Dудis (2004); pp. 390–400

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Homework Assignment 15

1. Watch the stories "Tobacco" and "Oklahoma City Bombing" on the DVD. Find six examples of plain verbs.
2. Find six examples of indicating verbs from the same stories. Provide an English translation of the sentence each verb appears in.
3. Watch "Cards" and "Reunion" on the DVD. Find six depicting verbs. Identify what type of depicting verb each represents—one that shows where something is located in space; one that describes something's shape or how it is arranged; or one that shows movement or action.

UNIT

20

The Function of Space

In this unit, we will discuss how space is used in a variety of different ways in ASL. Some functions of space are phonological, that is, they are a basic part of how the sign is produced. Some functions of space are morphological in that they are concerned with building new signs. Still other functions of space are syntactic, that is, they are concerned with the structure of sentences. Since space is used in all of these ways in ASL, discussing the function of space provides a nice framework for reviewing many of the concepts that were introduced in previous units. Karen Emmorey (1999) has described some of the key functions of space in ASL and we will summarize her discussion here (see the Supplemental Readings for the full article).

One function of space is simply articulatory. Remember that signs are composed of movement and hold segments and that segments include a bundle of articulatory features. Those features include handshape, location, orientation, and nonmanual signals. The location of the sign (i.e., where the sign is made) may just be part of how the sign is made. As we saw in the phonology units, location is a part of all signs. The location may be a place on the body. For example, *BORED* is signed on the nose, *FEEL* is signed on the chest, and *DIAPER* is signed at the waist. Location may also mean the signing space surrounding the signer—*WHERE* is made in the space in front of the signer’s dominant shoulder, while *SHOES* and *COFFEE* are made in the space in front of the signer’s torso. Each sign is made in a particular location, and that location is part of the structure of the sign, but the location itself does not have independent meaning. Sometimes, changing the location of the sign changes its meaning, as in the signs *SUMMER*, *UGLY*, and *DRY*, and in this case, space is used to indicate phonological contrasts.

Space can also be important in the expression of morphological meaning in ASL. While verbs in spoken languages are modified to show person and number by adding suffixes to a word stem, sign languages accomplish this partly with the use of space. We see this morphological use of space in verbs such as *GIVE*, for example. In the ASL sentence meaning “first-person-give-to-second-person” (PRO-1 GIVE PRO; in English, *I give you*), the hand moves from the space associated with the first person (the signer) to the space associated with the second person (the addressee). In the

sentence meaning “second-person-give-to-first-person” (PRO GIVE PRO-1; *you give me*), the hand moves in the opposite direction. We see the morphological use of space also in what are known as aspectual markers. For example, we can show that someone is giving continually or over and over again by the use of movement and space.

Space is also used for referential functions. That is, a location in space can be associated with a person or thing. This may be accomplished by producing the sign for the person or thing and then indexing (pointing to) a particular location in space. Signers may continue to refer to this location during the conversation by repeated indexing. Pronouns in ASL make use of indexing in a similar way. A pronoun sign can be directed at a specific point in space that is understood to refer to the person who has been associated with that location.

ASL signers use space to express locative information. We see a locative function of space in depicting verbs and locative verbs. In this case, space provides information about the location of a person or object in a three-dimensional framework. For example, when a signer is talking about a car moving from one place to another, the sign could be made with a 3 handshape that moves from one part of the signing space to another. Just as the handshape is understood to represent the car (through a conceptual blend), the locations in the signing space are understood to represent the locations where the car started and ended.

Space can also be used to indicate a signer’s frame of reference. For example, within a relative frame of reference, a signer usually describes a scene from his perspective. Some signs have intrinsic features (for example, cars have identifiable fronts and backs), and we saw that depicting verbs can make use of the signing space to visually represent these features through blending. Signers also can make reference to absolute frames of reference, as when they use the signs EAST, WEST, NORTH, and SOUTH.

Finally, space in ASL can be related to narrative perspective. In the course of telling a story involving different characters, a signer may assume the role of one of the characters. One of the ways the signer switches to a different role is through the use of space—the signer’s body may shift to one side, the eye gaze may shift, and the position of the head may change.

As we can see, space has many functions in ASL. In the previous units, we took a closer look at each of these functions. Now that you have learned about them all, you can take a step back and begin to look at ASL from a more holistic viewpoint, incorporating all of these different functions and features, often simultaneously, to create a rich and complex language.

SUPPLEMENTAL READING

“The Confluence of Space and Language in Signed Languages,” by Karen Emmorey (1999); pp. 348–376.

PART
FIVE

SEMANTICS

The Meaning of Individual Signs

Semantics is the study of the meaning of words and sentences. So far, we have looked at the basic units used to construct signs—movements and holds, handshapes, location, orientation, and nonmanual signals—that is, the phonological structure of ASL. We have seen how these parts can be used to construct new units, that is, the morphological component of the language, and we have seen how units are put together to form sentences. But for people who use language to communicate with each other, they not only need to share the phonology, morphology, and syntax of a language, but they also must share a system of meaning. The symbols and combinations of symbols must have shared value for the users of a language. Semantics is the study of the rule-governed ways in which languages structure meaning.

DETERMINING MEANING

How do we know what a sign means? When we see another signer use the sign CAT or HOUSE or THINK, how is it that we get the meaning intended by the signer from the combination of movements and holds, handshape, location, orientation, and nonmanual signals? Finding answers to these questions takes us back to the very first issue that we discussed, that is, the features that communication systems and languages have in common. You will recall that one feature that languages and other communications systems have in common is that they are shared by members of a community. The users of a language or variety of language determine what the meaning of a given combination of movements, holds, handshape, location, orientation, and nonmanual signals (that is, a specific sign) will mean.

Since meaning is determined by a specific community of users, the same combination of features, or the same sign, may have different meanings to different communities. For example, the combination of features that means NAME in ASL means ROME (the name of the capital city) in Italian Sign Language (LIS) (see Figure 85). The same combination of sounds that in spoken Italian functions as a feminine plural definite article—*le*—in spoken Irish means “with.”

Users of languages all over the world commonly look to written dictionaries as the definitive source for the meaning of words and signs, but it is important to remember that the people who write dictionaries derive their definitions of words



NAME (ASL) / ROME (LIS)

Figure 85. The same sign can have different meanings in different signing communities.

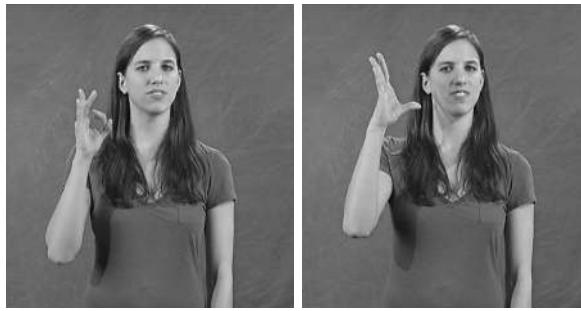
or signs by carefully observing the way words and signs are used by real people. Dictionaries for sign languages are unique in that, while they may be organized to reflect the linguistic structure of the sign language, they seem to be almost necessarily bilingual. That is, in addition to providing an inventory of the signs in a sign language, sign language dictionaries almost always also provide written glosses for the signs in the majority language of the community in which the sign language is used. Stokoe's *Dictionary of American Sign Language* was an exception because it did not present the signs by an alphabetical list of their English glosses, but rather by the parameters of location, handshape, and movement. The potential problem with bilingual dictionaries is that the same sign may have different English glosses assigned to it or different signs may be assigned the same English gloss. Therefore, the meaning of the sign may not always be clear from the gloss assigned to it.

Types of Meaning

Researchers have identified three different kinds of meaning: *referential* meaning, *social* meaning, and *affective* meaning.

Referential Meaning. Referential meaning is the idea, thing, or state of affairs described by the sign or sentence. For example, the sign CAT refers to a four-legged mammal with a tail, whiskers, and so forth. The meaning of the sign CALIFORNIA is the western state that has the Pacific Ocean to the west, Mexico to the south, Oregon to the north, and so forth. That state is the referent of the sign.

Social Meaning. Signs and sentences also provide information about the social identity of the language user. For example, certain choices of signs may reveal where the person is from, whether the person is male or female, or whether the person is African American or Caucasian. To illustrate this, imagine someone signing AWFUL with the strong hand pointing upward (Figure 86). Can you visualize a male signer using this sign? Most likely the answer is no. The reason for this is that most ASL users deem this production of the sign to be feminine. This is how social meaning is conveyed by this sign.



AWFUL

Figure 86. Social meaning conveyed by the signer.

Affective Meaning. Affective meaning provides information about the signer's feelings, attitudes, or opinions concerning a piece of information. Affective meaning can be conveyed by individual sign choice and by sentence structure. For example, a signer may be reporting a conversation that she had with another person in which the person talked about her work. One way to report the conversation would be to say "Alice explained to me about her fascinating research," while another way would be to say "Alice boasted to me about her boring old project again." Both sentences report the same basic information, that Alice talked about her work, but the signer's attitude toward what Alice said is completely different in each sentence. In the first sentence, the words *explained* and *fascinating* convey the meaning that the signer was really interested in what Alice had to say; in that second sentence, the words *boasted*, *boring old project*, and *again* clearly convey the message that the signer was not interested in what Alice had to say and had a negative opinion of her work. The difference in meaning between the two sentences is a difference in affective meaning.

Denotation and Connotation

The referential meaning of a sign or a sentence is often called its *denotation*, while the social and affective meaning is often called *connotation*. The difference between denotation and connotation can be illustrated with two signs in ASL that can be glossed as DEAF. The sign DEAF that is made with a 1 handshape that moves straight down from the ear to the chin denotes someone's audiological status and has a fairly neutral connotation. However, the form of the sign that is produced with a slow arc movement and with a puffed cheek, while still denoting someone's audiological status, also conveys the message that the person is a full-fledged member of the Deaf community (see Figure 87). This is a social connotation.

RELATIONSHIPS BETWEEN LEXICAL ITEMS

Users of a language know the phonological, morphological, and syntactic rules of their language, and they also know many individual words or signs. The collection

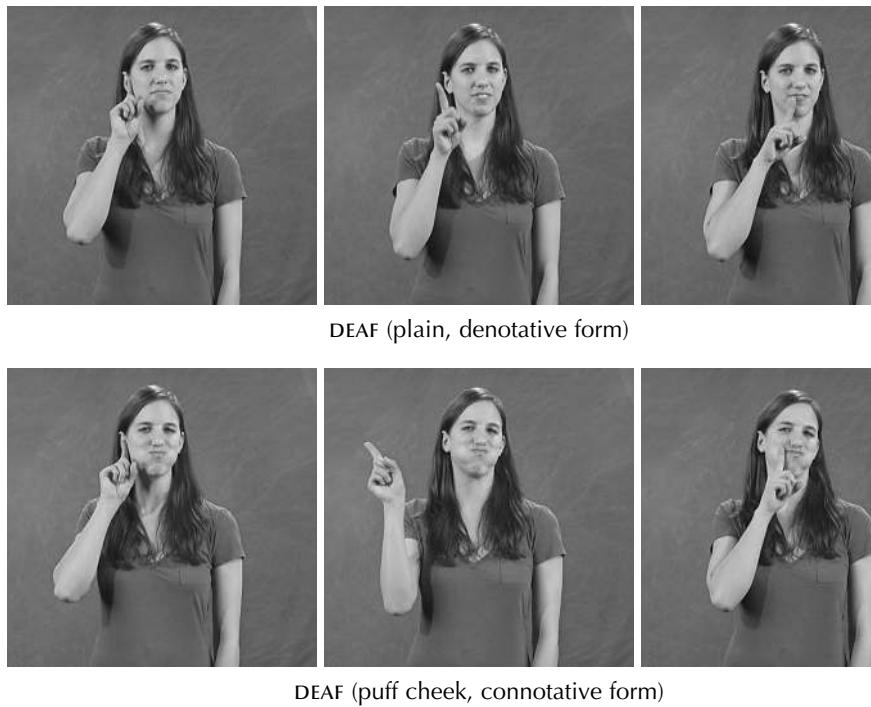


Figure 87. Denotative and connotative forms of DEAF.

of words or signs that they know is called the *lexicon*, and the individual words or signs in that collection are called *lexical items*. One area of semantics concerns the possible meaning relationships between lexical items in the lexicon. A number of different relationships can exist, including *hyponymy*, *part/whole relationships*, *synonymy*, *antonymy*, *converseness*, and *metaphor*. We will briefly discuss each relationship.

Hyponymy

Consider the signs BLUE, RED, YELLOW, GREEN, ORANGE, and PURPLE. You will quickly see that all of these signs are signs for colors. Now, ASL also has a sign COLOR. The referent for COLOR includes all of the signs in the set listed above, along with many other colors not listed. Each of the individual color signs has a meaning relationship with the sign COLOR: the sign COLOR is an inclusive term, and the meaning of each of the individual signs is included in the meaning of the sign COLOR. The signs for the individual colors are *hyponyms* (the prefix *hypo*-meaning “below”), and the sign COLOR is the *hypernym*. Another example is the hypernym SIGN LANGUAGE, which includes the hyponyms ASL, LSF (French Sign Language), LIS (Italian Sign Language), and LSQ (Quebec Sign Language).

Part/Whole Relationships

Another meaning relationship between signs is the one found between signs like HAND and ARM. This is not a hyponymic relationship because a hand is not a kind of arm. A hand is a part of an arm, and the referent of the sign HAND is included in the referent of the sign ARM. That is, an arm includes a hand. Another example might be the relationship between the signs PHONOLOGY and LINGUISTICS because phonology is a part of linguistics. The meaning of the sign LINGUISTICS includes the meaning of the sign PHONOLOGY.

Synonymy

We describe two signs as being synonymous if they “mean the same thing.” When we say two words or signs “mean the same thing,” we are generally talking about their referential meaning. For example, most users of English would agree that the words *sofa* and *couch* mean the same thing or that *soda* and *pop* refer to the same thing. But often words or signs that have the same referential meaning have different social or affective meaning. For example, the English words *think* and *cogitate* refer to the same mental activity, but *cogitate* tends to be used in fairly formal settings and not in more informal ones, unless the user is making a joke about the relative formality or informality of the situation. In ASL, DEAF signed with a 1 handshape from ear to chin has the same basic referential meaning of “audiological status” as DEAF signed with an A handshape at the ear then opening to a 5 handshape. However, the two signs have very different social and affective meanings. While the first is fairly neutral, the second generally has the meaning of “profoundly deaf,” and its usage is sharply restricted—it is generally not considered socially appropriate for hearing non-native signers to use this sign. So while the two signs may look like synonyms and are at one level, they are not synonymous at another level.

Another interesting comparison involves the pairs of signs in ASL such as BED and #BED, CAR and #CAR, or BUSY and #BUSY. One member of each pair is a lexical sign, while the other is lexicalized fingerspelling. They appear to be synonymous, and yet their occurrence may be governed by discourse factors. Although this has not been researched as yet, it is possible that the fingerspelled sign is chosen for emphasis. Again, these pairs of signs seem to be synonymous at a referential level but not at a discourse level.

Antonymy

Antonymy describes the relationship between two signs that are opposite in meaning, and it is a binary relationship; it can only describe the relationship between two signs at a time. There are two basic kinds of antonymy—gradable and nongradable. The signs LARGE and SMALL are antonyms, but it is easy to see how the concept of “large” and “small” are relative. For example, in the domain of vegetables, a cucumber is larger than a pea but smaller than a pumpkin. Gradable antonyms can



Figure 88. An example of variation in handshapes used for depiction.

thus show degrees of the concept to which they refer. Something can be relatively larger or smaller, something can be relatively harder or easier, even though **LARGE** and **SMALL** and **HARD** and **EASY** are pairs of antonyms. The English words *alive* and *dead* and the ASL signs **ALIVE** and **DEAD** are considered to be nongradable antonyms, in that one is either alive or dead but not both. But it should be pointed out that users of both English and ASL sometimes use nongradable antonyms as if they were gradable, as in the English expressions “half-dead” or “barely alive” and their ASL equivalents.

This brings us to some interesting observations about antonyms in ASL. One concerns the way in which the language shows gradation. For example, in English, degrees of size (large or small) may be shown by suffixation, that is, by adding the suffix *-er* or *-est* as in *largest* or *smaller*, or with separate and formally unrelated lexical items—*tiny*, *enormous*, *midsize*, etc. In ASL, when the goal is to show degrees of meaning, the first question the signer may ask is “what exactly am I talking about?” Representing the size of an object, place, or person is usually accomplished with depiction, and, as we know from the section on depicting verbs in unit 19, different handshapes are used for different entities. For example, the handshape used for representing the size of a car would vary depending on the actual size of the car being described. The handshape chosen to represent a limousine will be different from the handshape chosen to represent a small car, like a VW bug (see Figure 88). The handshape chosen to represent a thick book will be different from the one chosen to represent a thin book.

Specific handshapes may be accompanied by specific nonmanual signals; pursed lips may accompany handshapes representing thin objects, while puffed cheeks may accompany handshapes representing larger objects. In addition, it is also possible to show gradation when depicting varying characteristics of a specific entity. For example, the signer may choose a particular handshape to represent a limousine, but the relative size of the limousine can be varied by changing the ending location of the sign. Normally, the sign begins with the hands touching or close together, and then they move apart from each other; how far they actually move apart indicates the relative size of the limousine (usually with an accompanying nonmanual signal as well).

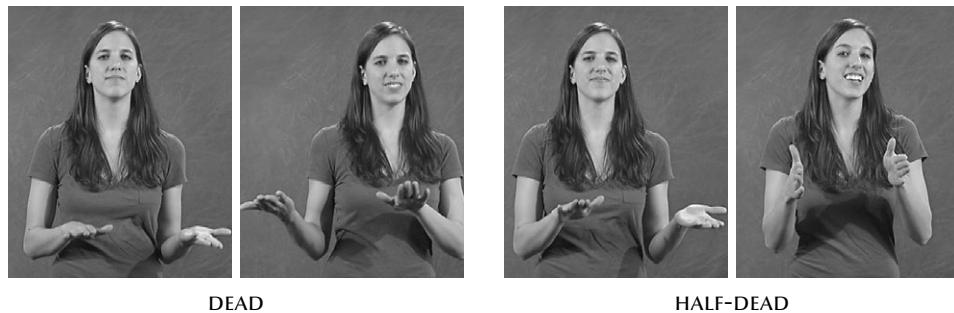


Figure 89. An example of gradation in lexical signs.

This, then, shows gradation by changing some aspect of the sign structure, in this case, location and nonmanual signal.

This is also the case for lexical signs. For example, the ASL equivalent of “half-dead” might consist of producing the sign DEAD but producing the final hold in a location closer to the initial hold than where the final hold is produced in the citation form of the sign. Gradation, then, is not represented by adding a whole new sign, but rather by altering some feature of the already existing sign (see Figure 89).

In this regard, consider the ASL signs GOOD and BAD. In English, the words *good* and *bad* are antonyms, but their respective phonological forms are completely unrelated. The ASL signs GOOD and BAD are also antonyms, but unlike the English pairs, their phonological forms are clearly related—they share a hold-movement-hold structure, as well as handshape and location. The difference in meaning lies in the difference in the final palm orientation, up for GOOD and down for BAD. There are other pairs of signs like this in ASL, such as LIKE and DON’T-LIKE, WANT and DON’T-WANT, and KNOW and DON’T-KNOW, pairs that also represent opposition in meaning. It would appear that these antonyms are related by a morphological process because the change in the final palm orientation has the effect of changing the meaning of the sign. While it is not clear that this morphological process is productive, that is, that new pairs of antonyms are being created, there does seem to be a difference between these pairs of antonyms in ASL and pairs of antonyms in English.

Converseness

Another semantic relationship between signs or words is called *converseness*. It is similar to antonymy and is seen in pairs of signs like WIFE and HUSBAND. If A is the husband of B, then B is the wife of A; WIFE is said to be the *converse* of HUSBAND. Other examples in ASL are pairs of signs like TEACHER and STUDENT or AUNT and NIECE. As with antonymy, the English words *wife* and *husband* have no formal resemblance to each other. However, in ASL, it seems that many pairs of signs that exist in a converse relationship also resemble each other phonologically. For

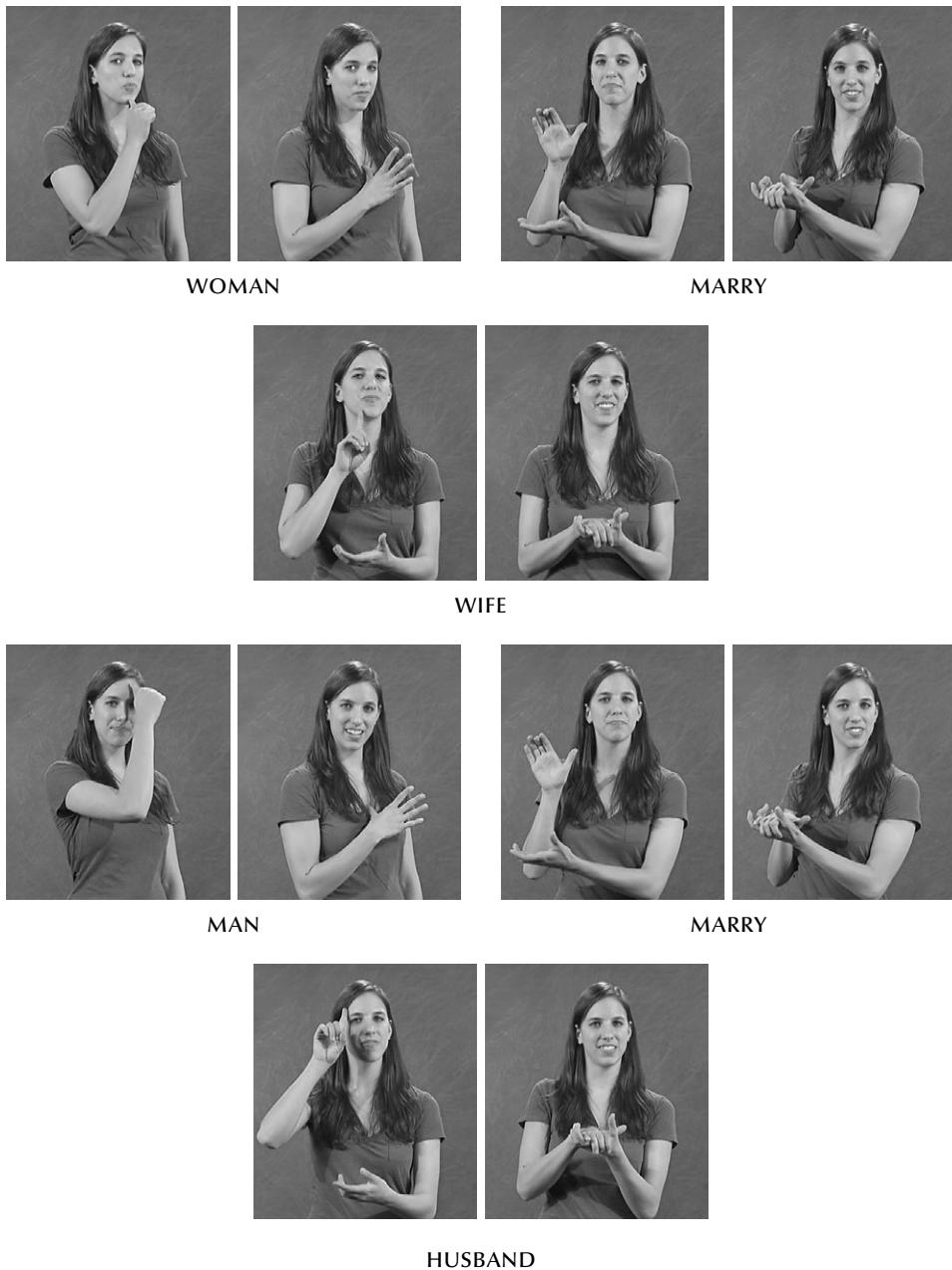


Figure 90. Signs can have a semantic and phonological relationship.

example, WIFE and HUSBAND are both compounds respectively resulting from the joining of WOMAN and MARRY and MAN and MARRY, and their form is very similar (see Figure 90). Likewise TEACHER and STUDENT probably result from a process of affixation in ASL, whereby a form having its origin in a sign for PERSON is attached to verbs, in this case TEACH and STUDY. Likewise, AUNT and NIECE have the same

structure and are produced in the same location with similar palm orientations; they differ only in handshape. So once again, it seems that in ASL, signs that have a semantic relationship may also share a phonological relationship.

Metaphor

The location feature of the ASL signs AUNT and NIECE brings us to another kind of meaning relationship between words and signs known as *metaphor*. A metaphor is generally defined as an extension of the use of a word or sign beyond its primary meaning to describe referents that are similar to the word or sign's primary referent. In English, for example, the word *head* (whose referent is "top part of an animal's body") is found in phrases such as *the head of the class* or *the head of the line*. In these phrases, the meaning of the word *head* has been extended to mean not only the top part of an animal but also the top part of other things.

In their book *Metaphors We Live By*, Lakoff and Johnson define three different kinds of metaphorical meaning: orientational, ontological, and structural. Orientational metaphors rely on spatial information to communicate the metaphor. For example, in many languages, the concept of *up* is related to positive meanings, while the concept of *down* is related to negative meanings. In English, this is seen in expressions such as *cheer up*, *lift one's spirits*, and *lighten up*, as opposed to *feeling down*, *what a downer*, and *being down and out*. Researchers such as Woll, Wilbur, Boyes-Braem, Frishberg and Gough, and Wilcox have researched metaphor in ASL and have pointed out that ASL also makes use of orientational metaphors. We see this in signs such as DEPRESSED and TIRED, in which the movement of the sign is downward, as opposed to THRILLED and HAPPY, in which the movement is upward. Upward and downward movement in ASL signs can also carry a metaphor of presence or absence, as in the signs APPEAR and DISAPPEAR.

Sarah Taub (2000) has researched metaphor in sign languages and discovered that there is a strong link in sign languages between metaphor and iconicity. Metaphor is the use of one domain of experience, the concrete one, to describe or reason about the abstract domain, and the iconic system of depiction in sign languages has movements, locations, and handshapes that can be used for the metaphorical description of abstract (nonphysical) situations. Taub explained that metaphor in sign languages involves *double mapping*—that is, there is a relationship between the concrete and the abstract, and a relationship between the concrete image chosen to represent the abstract and the forms (handshape, location, movement, palm orientation, nonmanual signals) of the language. The ASL metaphor ANALYSIS IS DIGGING shows this double mapping: DIGGING is a metaphor for the abstract concept of ANALYSIS, and this metaphor is represented in ASL by two oscillating Bent V handshapes moving downward in neutral space in a digging motion. This kind of double mapping for metaphor is widespread in sign languages.

Ontological metaphors treat abstract entities, states, and events as though they were objects. In English, for example, people talk about falling into or climbing out of a depression, as if the emotional state of depression were a tangible place. Likewise, they talk about working their way through a problem or being so busy

that they feel like they are treading water or just barely keeping their heads above water. In all of these cases, abstract emotional states are represented as though they were actual locations or objects. ASL also has ontological metaphors. For example, a signer might express strong interest in a particular academic area by producing the sign that could be glossed as FALL-INTO, with a Bent V handshape moving sharply downward (the base hand for this sign is a B handshape). The area of interest is thus portrayed as a location into which one can physically move. Likewise, during a discussion, a signer can indicate that a particular idea should be held until later in the discussion by producing a sign that consists of a C handshape closing to an S handshape. This sign strongly resembles the instrumental handshape used to represent the holding of various real objects. In the case of its metaphorical use, the idea is being treated as an object that physically can be held.

Finally, structural metaphors treat one concept in terms of another more tangible concept. A common example from English is the expression “time is money,” in which the abstract concept of time is treated as a tangible object that can be saved, wasted, spent, and so forth. Time is dealt with in a similar way in ASL, such that time that has run out may be represented with the same extent handshape that is used to show a depletion of tangible substances like water or paper.

One kind of metaphor that occurs frequently in ASL has to do with handshapes. Frishberg and Gough make reference to “families of signs,” that is, groups of signs that share the same handshape and that also share a portion of their meaning. For example, many signs produced with an Open 8 handshape have to do with emotions such as FEEL, EXCITE, DEPRESS, PITY, SENSITIVE, and SICK. Similarly, many signs having to do with negation and negative concepts are produced with an A handshape (e.g., NOT, DENY, REFUSE, BLAME, and SUFFER). Handshape would be considered metaphorical in these signs because while there is nothing inherently negative or emotional about the actual handshape, those handshapes have come to be associated with those meanings by users of the language. We cannot say that these handshapes are morphemes because they are not consistently associated with those meanings and handshape cannot be substituted in these signs to change the meaning of the sign in the way that it can in numeral incorporation, for example, where it is a morpheme. They are more like the examples of sound symbolism that we discussed for English, that is, groups of words like *lump*, *stump*, *hump*, and *bump* that share the sounds *-ump*. We don’t want to say that *-ump* is an English morpheme, but users of English would say that *-ump* symbolizes a meaning of heavy and thick.

This, then, is a brief introduction to some of the kinds of meaning relationships that may exist between signs. In the next unit, we will look at the semantics of sentences.

SUPPLEMENTAL READING

“Semantics: The Analysis of Meaning,” by William O’Grady (2005); pp. 431–458

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Homework Assignment 16

1. Find examples of ASL signs that illustrate the difference between *denotation* and *connotation*.
2. Find additional examples in ASL of the following meaning relationships:
 - a. hyponymy
 - b. part/whole relationships
 - c. synonymy
 - d. antonymy
 - e. converseness
 - f. metaphor

UNIT 22

The Meaning of Sentences

WORD ORDER AND SEMANTIC ROLES

We have seen some of the ways in which individual signs have meaning. We now turn our attention briefly to the ways in which sentences have meaning. First of all, we will see that it is not enough to simply say that the meaning of a sentence comes from just adding up the meanings of all the signs in the sentence. There is more to it than that. We can see this from the following two ASL sentences:

CAT CHASE DOG *The cat chases the dog.*

DOG CHASE CAT *The dog chases the cat.*

These two sentences have different meanings, and the difference in meaning comes from the *order* in which the signs appear. So, sign order or word order is an important factor in determining the meaning of a sentence. What is also important is the relative *semantic role* of each sign in a sentence. By *semantic role*, we mean how sentences show who did what to whom, with whom, or for whom. Examples of semantic roles are *agent*, *patient*, *experiencer*, *instrument*, and *cause*. For example, in the first sentence above, the cat is the agent, the “doer” of the action described by the verb, and the dog is the patient, the “receiver” of the cat’s action. In the second sentence, the same signs have opposite semantic roles—the cat is now the patient, and the dog is now the agent, showing us how important knowing the semantic role of a sign is in understanding a sentence. In the sentence JOAN LIKE PIZZA, Joan is the *experiencer*. She is not really doing anything or receiving any action; she is experiencing some physical or psychological sensation. In the English sentence *The key opens the door*, the semantic role of the word *key* is as *instrument*. The ASL version of that sentence might be as follows:

t
DOOR, KEY, dv: KEY-OPEN-DOOR

It is interesting to note that the semantic role of instrument is often realized in ASL with the use of a specific handshape during depiction, along with the sign for the instrument (see Figure 91).

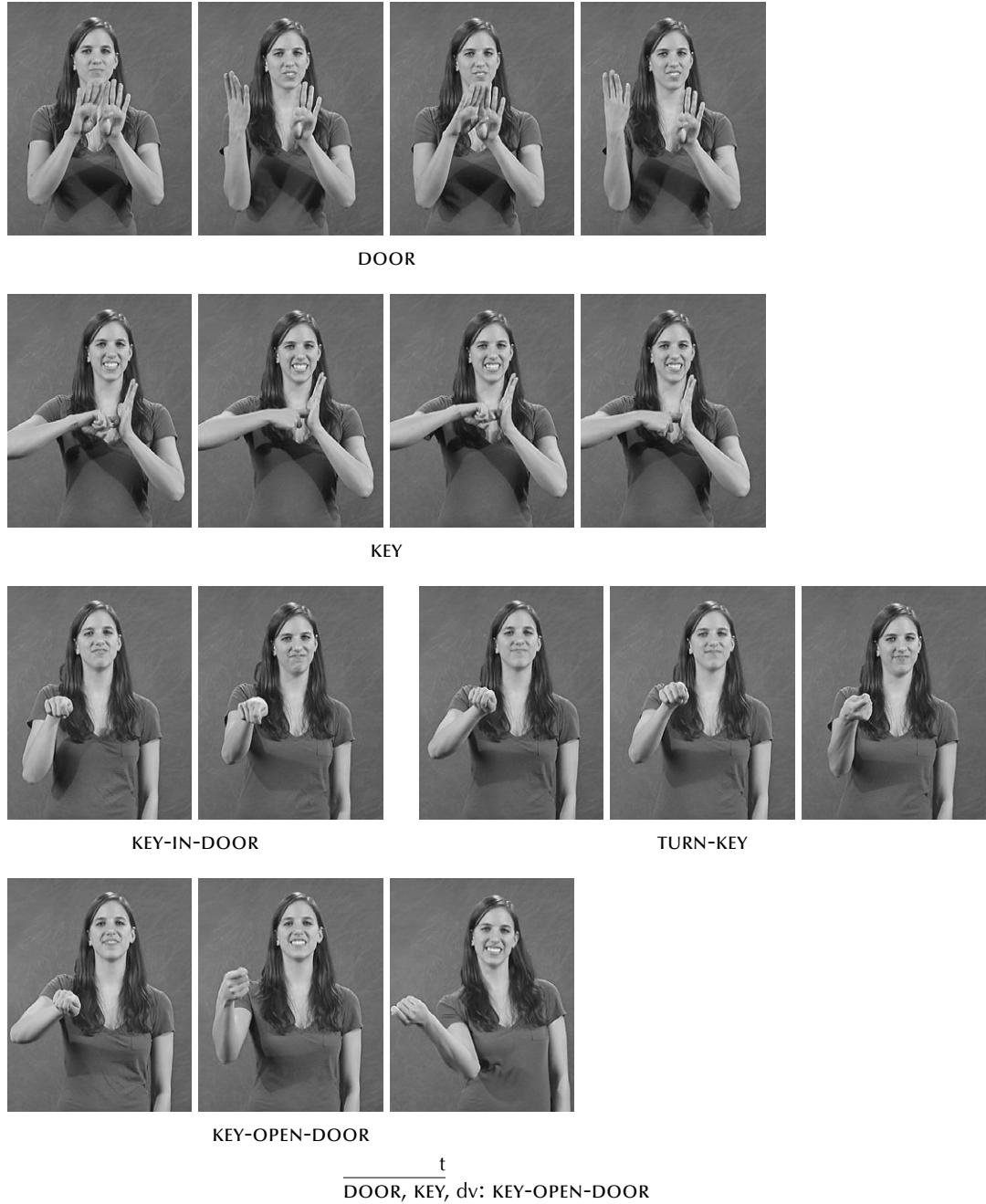


Figure 91. An example of the semantic role *instrument*.

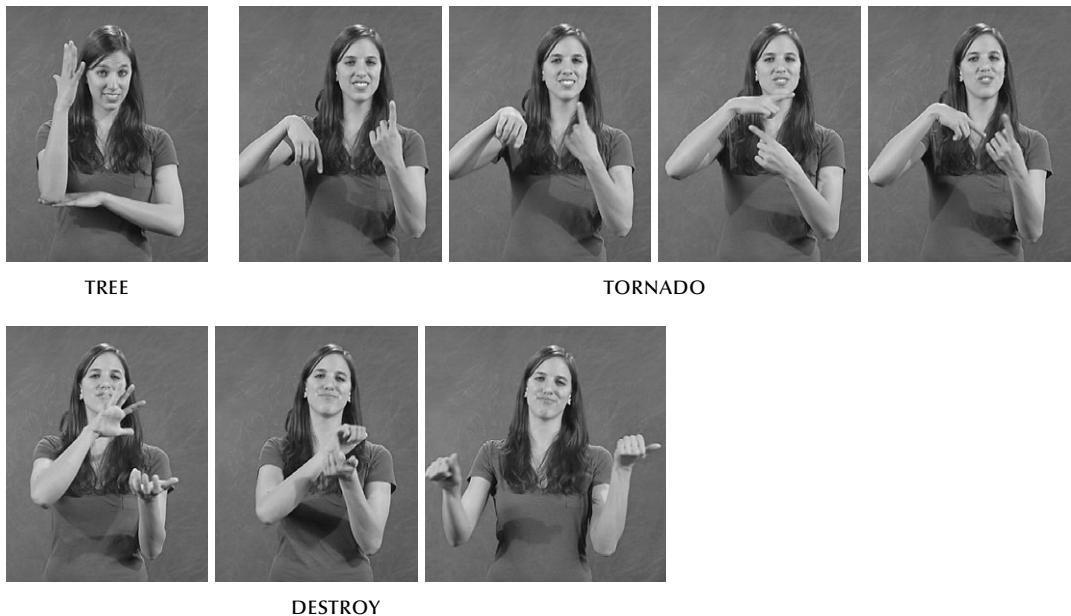


Figure 92. An example of the semantic role *cause*.

The final semantic role we will discuss is cause. In the English sentence *The tornado destroyed the trees*, the semantic role of *tornado* is that of cause. The same is true in the ASL version of this sentence, <TREE>t TORNADO DESTROY (see Figure 92).

FUNCTION WORDS OR MORPHEMES

Another way in which we understand the meaning of sentences is through the *function words* or morphemes in a language. Function words or morphemes indicate *tense*, *aspect*, *reference*, and *deixis*.

In spoken languages, tense is often indicated by bound morphemes that attach to verbs, as in the English past tense marker *-ed*. Tense may also be indicated by separate lexical items such as *last night* or *next year*. As we saw in the chapter on time in ASL, tense in ASL is often indicated by separate signs in a sentence and possibly also by the position of the body and the location of the hands in the signing space. For example, a signer may lean slightly backward and to one side while talking about an event that happened earlier than another event being discussed. Other markers of tense may exist in ASL, but research in this area has just begun.

Aspect has to do with the manner in which the action of a verb is performed, as we saw in the unit on temporal aspect. While in spoken languages aspect may be indicated by bound morphemes or by separate lexical items, we saw that ASL aspect is often shown by altering the basic structure of the sign, as in the sign SIT-FOR-A-LONG-TIME as opposed to SIT, or an X M H structure instead of a repeated M H structure.

Reference provides information about the relationship between noun phrases and their referents. For example, the English sentences *A cat is on the porch* and *The*



BOY DET SILLY

Figure 93. An example of a determiner providing *reference*.

cat is on the porch mean different things, and the difference in meaning comes from the use of the determiners *a* and *the*. The same holds true for ASL. The following sentences have different meanings:

| | |
|---------------|--------------------------|
| BOY/DET SILLY | <i>The boy is silly.</i> |
| BOY SILLY | <i>A boy is silly.</i> |

The determiner in ASL provides the meaning of “that specific boy” as opposed to “any unspecified boy” (see Figure 93).

Deixis (which comes from the Greek verb *deiktikos* meaning “to point”) marks the orientation or position of objects and events with respect to certain points of reference. For example, a teacher in a classroom asks the students “Do you have any questions about that?” while pointing to a problem on the blackboard. The pronoun *you* is considered an example of personal deixis (as are all personal pronouns) and refers to the students. The word *that* is an example of spatial deixis, and to understand it, the students must be able to see what it refers to (i.e., the problem on the board). A third kind of deixis, temporal deixis—the position or orientation of actions or events in time—is accomplished with separate lexical items or bound morphemes, such as the ones we discussed with relation to tense. Deixis is extremely complex for both spoken and signed languages, but it is easy to see that ASL has examples of all of the kinds of deixis mentioned (see Winston 1993 for examples). We see personal deixis in the personal pronoun system already discussed. When a signer mentions a place, a person, or an object during the course of a conversation and establishes it in space and then subsequently refers to that place, person, or object with an index finger or perhaps with eyegaze or both, that is an example of spatial deixis. And temporal deixis is done with separate lexical items and possibly body position and hand position, as we mentioned earlier.

CONTEXT

Even if we know the meaning of all the signs in a sentence and we can see what the semantic role of the signs is and can identify the function words or morphemes, sometimes that is still not enough to figure out the meaning of a sentence. Very often, the physical and social context in which a sentence is produced plays a



Figure 94. An example of the semantic role of *pragmatics*. The meaning of the sentence can vary depending on the context of the situation.

central role in revealing the meaning of that sentence. It is important to know who is producing the sentence, what his or her relationship is to the person seeing or hearing the sentence, and where the sentence is being produced. For example, the English sentence “It’s hot in here” may often be interpreted as a request for someone to open the window. There is nothing in the words themselves about a window or about opening a window. The sentence is simply a description of the condition of the room, but in many contexts it is seen as a request for action, and someone will get up and open a window. Given that there is nothing in the sentence itself that overtly mentions opening a window, that meaning must be coming from the situation or context in which the sentence is being produced. A similar sentence can be produced in ASL with similar results, so clearly context is important in understanding the meaning of ASL sentences as well.

The area of linguistics that investigates the role of context in understanding meaning is called *pragmatics*. In unit 1, we said that one thing that makes languages unique is that one sentence may have more than one meaning. What makes this possible is the role that the social and physical context plays in the meaning of the sentence. The ASL question HOME PRO may be simply a yes-no question with the function of requesting information (see Figure 94). However, it may also be a request for a ride home, even though there is no mention of a ride or of home, or it could also be a complaint by a boss to an employee who is leaving too early. Which meaning of the sentence is intended is in large part determined by the situation in which it is produced. We see, then, that what a sentence means is a lot more than just the sum of the signs or words produced.

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Homework Assignment 17

1. Find an example of an ASL sentence in which word order changes the meaning of the sentence.
2. Find an example of an ASL sentence that can have different meanings depending on the context and explain what the different contexts are and what the different meanings of the sentence are.

PART
SIX

LANGUAGE IN USE

UNIT 23

Variation and Historical Change

When we study a language it is important not only to look at its structure (phonology, morphology, syntax, and semantics), but also how the language is used. Human beings use language every day in a variety of social settings and for a variety of reasons. Ralph Fasold (1984), a sociolinguist, pointed out that while we do use language to communicate information to each other, we also use language to define the social situation; in other words we use language to make our social and cultural identity clear, to show our group loyalties, to explain our relationships to other people, and to describe what kind of event we think we are involved in. Language, therefore, has different functions: it has communicative functions and it has social functions.

Dell Hymes, an anthropologist, introduced the concept of *communicative competence*. According to Hymes (1972), when someone knows a language, he or she knows how to use the forms of the language; knows the phonology, morphology, and syntax of the language; and knows how to use the language appropriately. This means the person knows how to enter or leave a conversation properly, what kind of language to use for a request or an apology, what kind of language is appropriate for different social situations, and so forth. When a user of a language is communicatively competent, he or she knows how to use language for both communicative and social functions.

Sociolinguistics is the study of the interrelationship of language and social structure. Sociolinguists study variation in language, contact between languages, language planning and policy, language attitudes, and the relationship between social interaction and language, including the structure of conversation. In this section, we will provide an introduction to three major areas of sociolinguistics—variation, discourse, and bilingualism and language contact.

VARIATION

Variation in language means that people have different ways of saying the same thing. The earliest studies of variation in language focused on *regional variation*. People in one geographic area may use a language differently from people in

another geographic area, even though the language they are using has the same name. For example, in the United States, many regional differences are found in the vocabulary of spoken English. Some people use the word *sofa*, while others say *couch*, and still others say *davenport*; some people say *soda*, while others say *pop* or *coke* or *soft drink*; some people say *bag* while others say *sack* or *poke*; some people use the word *supper* while others use *dinner*, and so forth.

Regional differences can also be found in the phonological system of the language. Those differences may be referred to as *accents*. For example, someone from Boston may have a New England accent, while someone from Atlanta may have a southern accent. This simply means that certain sounds in the speaker's phonological system are consistently produced in a way that is different from the sounds in another speaker's phonological system. A speaker from Boston may say the *a* in the words *car* and *father* differently from a Chicagoan, and the Boston speaker may not produce the *r* in either word. There also may be some morphological and syntactical regional differences.

Variation is not limited to regional variation. Other kinds of variation include *social variation*, *ethnic variation*, *gender variation*, and *age variation*. For example, people from different socioeconomic groups within the same society may speak differently—differences have been described between working-class and middle-class speakers of American English. African American people may speak differently from white people, men may speak differently from women, and old people may speak differently from young people.

The same kind of variation exists in American Sign Language. We see variation at all levels of ASL structure: phonological variation, morphological variation, and lexical variation. Many examples of lexical variation have been documented. Ask a group of native ASL signers to show you their signs for PICNIC, BIRTHDAY, HALLOWEEN, EARLY, and SOON and you will see examples of regional variation (see Figure 95). Some of the variation exists because, in the past, deaf students attended the residential school in their region and did not have much contact with signers from other areas. Another reason for variation is that ASL was not formally taught or even recognized in the schools.

Despite the variations in ASL, it seems to be somewhat more standardized than other sign languages. Italian Sign Language (LIS), for example, seems to have much more regional variation than ASL. This may be because in the early decades of deaf education in the United States, many teachers, both deaf and hearing, came to the American School for the Deaf in Hartford, Connecticut, from all over the country to learn Laurent Clerc's teaching method. They then returned to their schools. Many graduates of the school in Hartford established schools for the deaf in other parts of the country. As a result, both the teachers and the graduates took with them the ASL they had learned in Hartford. Not so in Italy, where there were few centralized schools and where only fairly recently the deaf communities in the different cities have begun to have contact. For a long time the many deaf communities were isolated from each other, each with its own sign language, and no attempt was made by school administrators to establish contact among students in schools for the deaf. The result is a lot of regional differences.

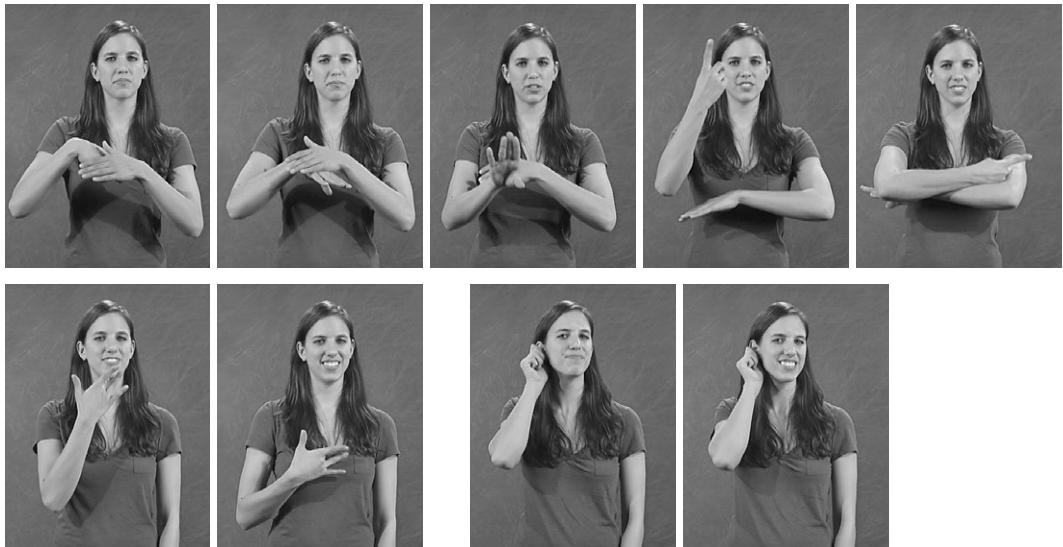


Figure 95. Regional variations of BIRTHDAY.

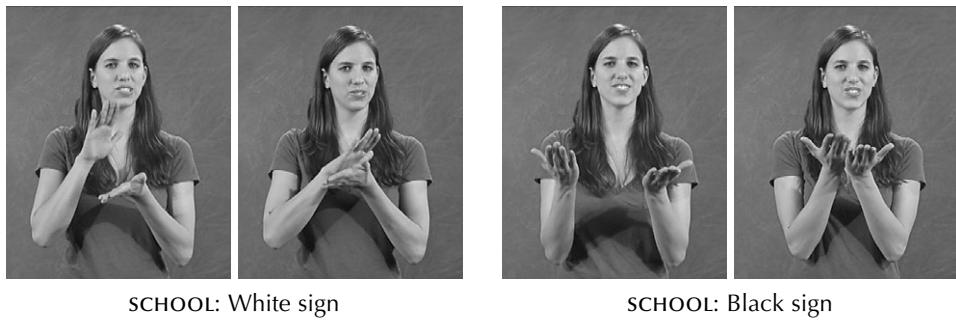


Figure 96. Ethnic variations of SCHOOL.

ASL also has ethnic variations. Anthony Aramburo has found that Black signers and White signers use different signs for SCHOOL, BOSS, and FLIRT (see SCHOOL in Figure 96). This variation is probably due to isolation and lack of contact between Black and White Deaf communities as a result of segregated education. Research on the ASL used by Black signers has been done by Jeff Lewis (1997) and by Carolyn McCaskill, Ceil Lucas, Robert Bayley, and Joseph Hill (2011). The latter study examined whether the same kind of linguistic features that have been identified for African American English (AAE) could be identified for Black ASL. The first school for Black deaf children was established in North Carolina in 1869, and separate schools or departments opened in 16 other southern states and the District of Columbia. The Southern School for Deaf Negroes (SSD) in Louisiana was the last to open, in 1938, and the last to close, in 1978. The researchers interviewed people over the age of 55 who had gone to segregated schools and people under 35 who went to integrated schools, in 6 of the 17 states. The researchers found that

there are features that define Black ASL as a distinct variety and also that, because of integrated schooling, this variety seems to be changing. On the DVD, you can see clips of signers from the six states included in the study.

Research has also been done on the sign language used by Navajo Indians in Arizona (Davis and Supalla 1995) and on the Tactile ASL used by deaf-blind people (Collins 2004; Collins and Petronio 1998; Haas, Fleetwood, and Ernest 1995). These studies have revealed some interesting variation patterns.

Signers also report gender variation, that is, differences between the way men and women sign, although this is an area that still needs to be researched. And there are also age differences, such that older signers may have ways of signing that differ from younger signers. Students often report forms of signs that they have seen used by older friends and relatives. This brings us to the issue of historical change.

HISTORICAL CHANGE

As we said, variation means a different way of saying the same thing. Often, the same person will have different ways of saying the same thing and will make a choice depending on the situation. And often the different forms will stay in the language indefinitely. But many times, a change in an existing form will be introduced, or a whole new form will appear. The old form and the new form may coexist for a while, and then the old form may disappear. This process is called *historical change*.

Historical change in languages often takes place in the vocabulary and in the phonology, but some changes may happen in the morphology and syntax as well. An example from spoken languages is the evolution from Latin to the Romance languages (French, Italian, Spanish, Portuguese, and Romanian). The changes in Latin were the result of the passage of a great deal of time and social change. However, if we were able to visit what is now France in the year A.D. 800, we would see that older speakers in a given community on a given day in the marketplace spoke differently from younger speakers. For them at that moment in time, it would simply look like variation (i.e., “we have different ways of saying the same thing”). From our modern perspective, it looks like historical change. Gradual changes in all parts of the language took place over a very long period of time, such that modern French is completely different from the Latin that is its base.

Researchers such as Nancy Frishberg, James Woodward, Carol Erting, and Susan DeSantis have described historical change in ASL, and other researchers such as Emily Shaw and Yves Delaporte have described historical change in other sign languages. Many ASL signs bear a close resemblance to French Sign Language (LSF) signs because Clerc was a signer of LSF. We can see evidence of historical change from LSF to ASL. For example, signs such as CAT, COW, HORSE, and DEVIL that were produced with two hands in LSF are produced with one hand in ASL. Some LSF signs that were produced on the elbow (HELP and GUIDE) are now produced on the weak hand in ASL.

Some changes have occurred as a result of assimilation, where the handshape of one hand has become like the handshape of the other. In an older form of the

sign TOMATO, the dominant hand is a 1 handshape while the passive hand is an O handshape. Over time, the passive handshape has become a l. We see this with other signs as well, such as LAST, BELIEVE, and HUSBAND. Sometimes the location feature of a sign changes with time, as in the sign WRONG, which in an older form was produced on the mouth and is now produced on the chin; or the sign FEEL, the location of which has moved from the left side of the chest to the middle. And while some signs have changed from being two-handed to one-handed, others such as DIE and JOURNEY have changed from being one-handed to two-handed. These are all examples of historical change in ASL.

DOCUMENTING CHANGE IN ASL

One of the unique characteristics of language is that it changes over time, and the change is continual. We can see evidence of some of the changes that occurred in ASL during the twentieth century by watching George Veditz sign “Preservation of the Sign Language” on the DVD. Veditz, a graduate of Gallaudet College, was a respected teacher and leader in the Deaf community. He taught at both the Maryland and Colorado Schools for the Deaf and served two terms as president of the National Association of the Deaf. In this speech, given in 1913, he expresses his concern for the need to preserve sign languages in the face of strong pressures from educators who endorsed oral-only communication for deaf children.

We also can see changes going on right now with the introduction of new terms for *telephone*, *television*, and *computer technology*. For example, the different signs that exist for *computer* reflect both regional differences and changes in technology. Similarly, the sign for changing channels on a television, an iconic sign of a hand turning the channel knob, is being replaced by a newer sign that is an iconic representation of a remote control.

The older form of HOME was a compound consisting of the signs EAT and SLEEP. The handshape of SLEEP assimilated to the EAT handshape, and the location of EAT assimilated to the SLEEP location. It is not uncommon now to see a form of the sign HOME that touches the cheek twice in the same location on the lower cheek. As we said, language is always changing.

Ceil Lucas, Robert Bayley, and Clayton Valli, with the participation of Mary Rose, Alyssa Wulf, Paul Dudis, Susan Schatz, and Laurie Sanheim, conducted an extensive study of variation in ASL (2001). Their seven-year project targeted seven sites in the United States—Staunton, Virginia; Frederick, Maryland; Boston; New Orleans; Kansas City, Missouri; Fremont, California; and Bellingham, Washington. In all, they videotaped 207 ASL users engaged in everyday conversation. The study looked at phonological variation in signs made with a 1 handshape (recall the discussion of assimilation in unit 7), variation in the sign DEAF (signed from ear to chin, from chin to ear, or as a single contact on the cheek; recall the discussion of metathesis in unit 7), and variation in the location of signs such as THINK, KNOW, and SUPPOSE, which are produced on the forehead in citation form but can move down and be produced below the forehead.

The researchers' original hypothesis was that the variation observed in all three variables could be explained by phonological factors (that is, the characteristics of the location or handshape of the preceding or following signs). But when they analyzed almost 10,000 examples of the three variables (1,618 for DEAF, 2,862 for location signs, and 5,356 for 1 handshape signs), they found that while phonological variables do show some effect, the major factor in explaining the variation is the grammatical function of the sign. Specifically, DEAF can function as an adjective, noun, or predicate, and the noncitation forms (chin-to-ear or contact-cheek) are much more likely to be adjectives, while the citation form (ear-to-chin) is more likely to be a predicate. With location signs, verbs favor citation forms (at the forehead), while function words like prepositions favor the lower noncitation forms. First-person pronouns favor noncitation 1 handshapes (thumb open or all fingers open) second person is neutral, and third-person pronouns and content signs (nouns and verbs) favor citation forms (thumb and all fingers except index closed).

The study also found correlations with social factors. For example, with the sign DEAF, younger and older signers in general favor the chin-to-ear form, while middle-age signers favor the ear-to-chin form. Signers from Boston and Maryland strongly prefer the ear-to-chin form, while signers from the other areas are neutral or prefer the chin-to-ear form. And while older signers prefer the forehead level for the location signs, younger signers prefer the lower forms.

Morphosyntactic variation includes the dropping of subject pronouns with verbs that usually require a subject, such as FEEL, KNOW, and LIKE. Lucas et al. (2001) looked at plain verbs (verbs that do not include any information about the subject) and found that these verbs are more likely to occur without a signed pronoun than with one. Key factors in accounting for the variation are switch reference (whether the subject of the target verb is the same as the immediately preceding subject or different), the person and number of the pronoun (a first-person pronoun is more likely to be signed than other pronouns), and English influence (a pronoun is more likely to occur in a more English-like sentence). Older signers and women are more likely to produce pronoun subjects than omit them.

Lucas et al. (2001) also studied lexical variation by asking signers to demonstrate their sign for 34 separate concepts, such as RABBIT, COMPUTER, AFRICA, and JAPAN. They found a distinction between lexical innovation and phonological variation. For example, the new signs for AFRICA and JAPAN are lexical innovations and these new signs have been adopted by all age groups in all seven regions of the study. The old and new variants of signs like RABBIT (the old sign produced at the forehead and the new sign made on the hands in neutral space) are used by all age groups, indicating that while change may be in progress, it is not a completed change. If the change were completed, we would expect younger signers to use only the newer forms. This project shows that ASL, like other languages, has sociolinguistic variation, with both linguistic and social factors accounting for the variation. The Black ASL project (McCaskill et al. 2011) revealed similar results. The signers interviewed demonstrated many signs unique to the Black community and also unique to their geographical areas.

SUPPLEMENTAL READINGS

Files 10.1, 10.2, and 10.3 from *Language Files: Materials for an Introduction to Language and Linguistics* (2004); pp. 459–469

“Analyzing Variation in Sign Languages: Theoretical and Methodological Issues,” by Rob Hoopes, Mary Rose, Robert Bayley, Ceil Lucas, Alyssa Wulf, Karen Petronio, and Steven Collins (2000); pp. 470–491

“Variation in American Sign Language,” by Ceil Lucas and Robert Bayley (2010); pp. 492–511

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Homework Assignment 18

- 1.** Find and list as many examples as you can of signs that vary from region to region. Are the signs completely different or are they basically the same, with variation only in handshape or location or palm orientation? Do you see any signs in the Kansas and Louisiana conversations or in the ASL PAH! stories that are different from the signs you use?
- 2.** Find and list examples of signs that older and younger people use differently and discuss the differences you see. One area in which you might find differences are in the signs for countries.
- 3.** Watch “Preservation of the Sign Language” on the DVD. This clip is taken from a speech George Veditz made to the National Association of the Deaf in 1913. As you watch the speech, you will see many examples of the differences between ASL in 1913 and now. List as many of the differences as you can find and classify them. For example, are the differences in parts of signs or in whole signs?

UNIT 24

ASL Discourse

Throughout this textbook, we have seen that the different parts of ASL have internal structure. In the phonology section, we saw that signs have parts and that the parts are structured. In the morphology section, we looked at the smallest meaningful units of ASL and talked about how they are used to build new units in the language. In the section on syntax, we saw that ASL sentences are also structured; word order is not random, and nonmanual signals play a very important role in the construction of ASL sentences. So, we have seen that there is structure at each level of the language. But there is more to language than single isolated sentences. People talk to each other, they sign to each other, and they write letters, novels, and newspaper articles. These are all examples of the use of language, and the use of language involves using many sentences.

When people talk or sign or write, the language they use also has structure; that is, words and sentences are not just thrown together in any order. In sociolinguistics, the term *discourse* is used to refer to any use of language that goes beyond the sentence. Discourse can refer to how language is organized in conversations, and it can also refer to how the sentences in a written text, such as a novel or a linguistics textbook, are organized. Language has social functions as well as communicative functions, and, therefore, language is a kind of social behavior. The analysis of discourse has a lot to do with the social functions of language. In this unit, we will provide a brief introduction to discourse analysis and look at some examples of the structure of discourse in ASL.

As explained by sociolinguist R. A. Hudson (1980), the study of discourse involves a number of different areas, four of which we will discuss here — the functions of language, language as skilled work, the norms and structure of language use, and language as a signal of social identity.

THE FUNCTIONS OF LANGUAGE

Language has social functions as well as communicative functions. We do not always use language just to communicate information. Often, language is used to establish

or reinforce social relations or to control the behavior of other people. For example, imagine that you are walking down the street and you see an acquaintance — not someone you know well, not a friend, but someone you recognize — coming toward you. You don't really want to stop and chat, so you keep walking, but as you walk by, you make eye contact and either nod your head or sign a greeting. You may even sign WHAT'S UP and FINE or nod your head as a greeting as you walk by, and the other person may sign the same signs or nod at the same time. The function of language in this situation is not only to exchange information but also to let the other person know that you see him and that you are not ignoring him.

To get a better understanding of the social functions of language, imagine how strange it would be to walk by an acquaintance and not sign anything! If someone you knew walked by you without a greeting, you might think that person was being rude or impolite. That leads us to ask what politeness means. In part, it means recognizing the existence of another person, and the way we accomplish that recognition is with language.

We use language for other social functions as well, such as apologizing, warning, threatening, commanding, and requesting. All of these functions go beyond the purely communicative function of telling someone something she does not already know. In fact, you may sometimes tell someone something she does already know, as a way of controlling behavior. For example, telling someone "it's cold in here," may have the function of requesting that the person close the window. We can also see that discourse varies in a broader sense, depending on its function. That is, the language used in an everyday conversation is different from that used in a classroom lecture, a sermon, or a conference presentation. The language used in stories and poetry has its own structure, as does the language used when an interpreter is present. These are all examples of different genres of discourse.

LANGUAGE AS SKILLED WORK

Some people are very skilled at getting what they want through the use of language, and others are not. Many cultures tend to respect and reward skilled language users; for example, elections can be won or lost depending on a politician's ability to use language. In the American Deaf community, storytellers and poets are recognized and valued not for the content of their work as much as for their skill in the use of ASL. At Deaf social gatherings and parties, people play ABC and number games in ASL, and those who do it well receive the most praise and respect.

THE NORMS AND STRUCTURE OF LANGUAGE USE

Discourse has internal structure and is governed by norms. By norms, we mean how many people can sign at once, how much one person should sign, what topics, if any, are taboo, and so forth. It is easy to identify the norms by looking at examples of norm violations. For example, in a conversation, only one person can sign at a time. If another person begins signing before the first has indicated that he is finished, the second person will be said to have interrupted. The first person may then signal

that he is not finished yet and that the other person should wait his turn. The fact that the second person's behavior is labeled an interruption shows that the norm is "one person signs at a time and when it is clear that he is finished, another person may begin."

Another norm governs the appropriate behavior when walking between two people who are signing to each other. In spoken-language conversations, it is polite to say "excuse me" as you pass. That is, it is appropriate to use language to recognize the fact that you are temporarily in the way. However, in the Deaf community, it is perfectly acceptable and polite to walk between two people having an ASL conversation without signing EXCUSE-ME. Not only is it polite, but to stop and sign EXCUSE-ME or to duck one's head or bend over as one walks by may even be unacceptable because it almost always brings the conversation to a halt and causes an interruption. This is a norm that differs from the norms for spoken-language conversations.

You probably know someone who has been described as being a nice person but who talks too much. The unspoken meaning is that the person always says more than is necessary or talks about things that are not appropriate. The norms here concern quantity and quality of discourse — how much and about what we should talk. Finally, norms dictate what topics can be discussed in which settings. Not all topics are considered suitable for all settings. Some topics are acceptable in public settings, and others are acceptable in private settings. Language users have ways of communicating to each other that the norm is not being followed, that what is being discussed should be addressed at another time. Spoken-language users have ways of talking about private issues in public places (e.g., whispering), and we see examples in ASL, as well. Signers may use reduced forms of signs or sign with one hand in a very reduced signing space. Unfortunately, not much research has been done on this aspect of ASL discourse as yet.

Internal Structure

Discourse has internal structure that comes about in different ways. One way is *turn-taking*. Since everyone in a conversation does not sign at once, signers have different ways to get and keep a turn in conversation. For example, when a person is signing and then comes to the end of a thought, she may pause. If another person in the conversation *self-selects*, that person will take the next turn. If the second person does not self-select, the first person may continue signing or the conversation may end. Another way to get a turn occurs when the first person asks the second person a question, thereby giving the next turn to the second person.

It is important to notice that turn-taking varies depending on the social setting. In a regular conversation, it is usual for conversational partners to self-select unless one person asks a question of another person. In a classroom, however, it is generally the teacher's responsibility to select who gets the next turn; students generally don't self-select. In a courtroom, it is customary that an attorney asks questions of the witness on the stand and the witness answers; witnesses do not usually ask questions.

We also have ways of keeping a turn in conversation once we have gotten it. You will notice in sign conversations that often, if someone tries to interrupt a signer, the signer will lower or avert his eyes and perhaps hold up an index finger or an open hand to indicate that he is not done yet. In fact, as Baker (1977) and other researchers have found, eye gaze is very important in structuring conversations in ASL. Rieger (2001) identified various signs, gestures, and facial expressions used to maintain a turn.

Discourse also may be structured by topic. That is, when a topic is introduced, it controls the flow of a conversation. We may stay on the topic, we may go from general to specific aspects of the topic, we may introduce issues related to the topic, and we may stray from the topic or introduce a new topic. Language has ways of showing how we are dealing with a topic. For example, speakers of English may say, “On a related topic . . .” or “I don’t mean to change the subject, but . . .” to inform others that a change is taking place.

We see examples of structure by topic in ASL. Roy (1989) looked at the structure of a high school science lecture and saw that the teacher used the signs NOW and NOW-THE-TALK to structure his talk. The talk was divided into very clear episodes, and the transitions between the episodes were marked with these signs. In this way, the students watching the lecture were easily able to follow the presentation of the topic and the subtopics. Roy also found that the teacher used *constructed dialogue*, which made the lecture very interesting for the student. Constructed dialogue is used in conversations to tell someone about a conversation that has already taken place — “He said . . .,” “Then I said . . .,” etc. During the constructed dialogue, the signer usually shifts her body and her eye gaze so that it is perfectly clear when she is talking and when the other person is talking. Signers may even report a conversation between two other people and take the role of each by shifting the body and eye gaze.

Hudson suggested that discourse may also be structured by what he calls *encyclopedic knowledge*. That is, the knowledge about a topic that one person brings to a conversation may be very different from the knowledge that another person brings to the conversation. For instance, if you are explaining ASL structure to someone who has no knowledge of it, you will go into much greater detail and have longer turns than if you are explaining it to someone who shares your knowledge. What we know and what we think the other person knows structures our conversations.

Register Variation

The structure of discourse may differ depending on the setting, that is, where and when a conversation takes place. This is known as *register variation*. Register, in this case, means “language appropriate for a certain occasion.” This has traditionally been a very difficult area to describe in any language, but a fairly clear example can be seen by comparing signs used in *informal* and *formal* settings. In informal settings, many two-handed signs may be signed with one hand (COFFEE, TEA, VOTE, PEOPLE, etc.; see Figure 97). In many pairs of signs that have the same meaning, one sign is used in formal settings and the other sign is used in informal settings.

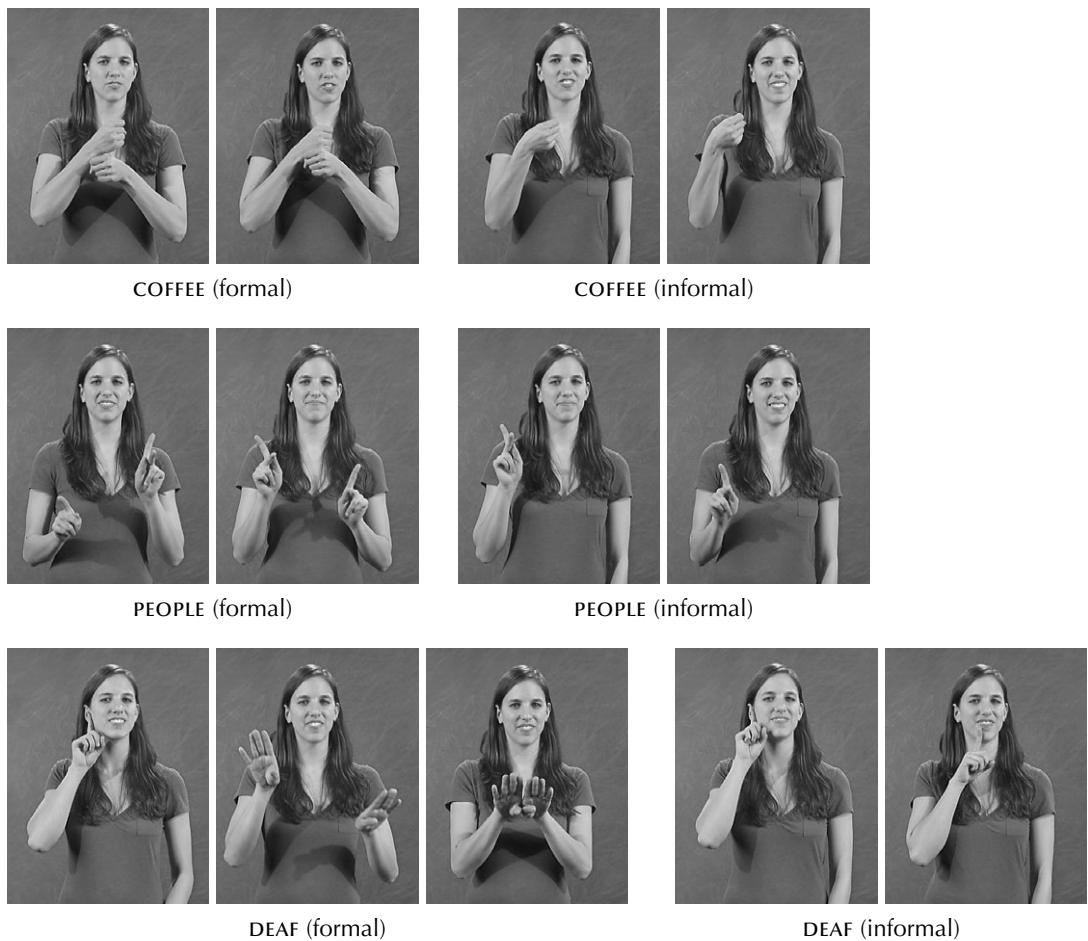


Figure 97. Examples of register variation.

The sign used in informal settings would be totally unacceptable in formal settings. This is true of the two-handed form of DEAF, which is used in formal settings, and the form of DEAF produced at the ear location.

The location of signs may vary depending on the social setting. In formal settings, the sign KNOW may be made on the forehead, while it may be made on the cheek or in the space in front of the signer in informal settings, or it may be a wiggle of the nose. Zimmer (1989) compared one person's signing production in a formal lecture, in a television interview, and in an informal conversation and found that signs used in the informal setting — PEA-BRAIN, WHAT'S-UP, KISS-FIST ("adore") — did not occur in the formal setting. She saw many rhetorical questions in the lecture but none in the informal and television interview settings. She also found that the signing space in the lecture was much larger than in the other two settings and that the signer used more topicalization in the informal setting than in the formal one. Quinto-Pozos and Mehta (2010) examined gestures used in ASL narratives

and found that differences in production depended on whether the narratives were signed in formal or informal settings.

LANGUAGE AS A SIGNAL OF SOCIAL IDENTITY

The final area of discourse is language used as a signal of social identity. A good example from English is the use of first names as opposed to a title with a last name. Do we call someone we have just met “Dr. Wilson” or “John”? And if we start out calling someone Dr. Wilson, how do we know when it is acceptable to start calling him by his first name? The use of a first name or a title with a last name indicates the social identity of both the speaker and the person being spoken to. It reveals the social relationship between the two people.

If you have studied Spanish, French, Italian, German, or other languages, you know that many languages have complex ways of showing social relationships through pronouns. These languages have pronouns for formal situations and pronouns for informal situations. The pronouns used by a supervisor and an employee may be different from those used between friends. Not very much is known about how ASL or other sign languages signal social identity, but this is a fruitful area for future research. Think about your own use of ASL: Do you use first names and names with titles in your conversations, as spoken languages do? How do you signal that you are a student and that you are talking to a boss or a professor? Do you sign differently with a good friend than with a teacher?

NEW AREAS OF RESEARCH

In recent years, the analysis of ASL discourse has focused on a variety of areas, including the use of nonmanual signals such as eye gaze and mouthing (Bahan and Supalla 1995; Bridges and Metzger 1996; Hoza, 2008) and the use of space for reference (Emmorey 1999; Emmorey and Reilly 1995; van Hoek 1996; Winston 1993, 1999). Studies also include the analysis of parent-child discourse (Volterra and Erting 1994), interpreted discourse (Metzger 1995; Roy 1996), and classroom discourse (Smith and Ramsey 2004).

Mulrooney (2009) examined ASL personal narratives and found that signers use a consistent structure to organize spontaneously produced narratives. This structure consists of six possible parts: an introduction identifying the topic of the narrative, background information about the events, the main events describing what happened, explication of the most significant event, reflection on the events, and a closing. This research used features not traditionally incorporated into a narrative analysis, including eye gaze, body postures, facial expressions, gestures, and partial demonstrations of actions. Mulrooney argues that these features are critical to an effective analysis of ASL. Her findings align with other research about space and gesturing in ASL that may provide important information about spoken language discourse as well (Taub, Galvan, Pilar 2009).

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Homework Assignment 19

1. You are walking along and you see a group of your friends talking. You want to join the conversation. Think about and describe how you enter the group and how you get a turn to talk. What signs do you use? What about eye gaze? What is the correct way to enter a conversation and what is the “wrong” way?
2. What do you do in an ASL conversation when you want to change the topic? What signs do you use? Is there a particular way to change the subject?
3. Make a list of five signs that are signed differently in formal and informal situations, and describe how they differ. For example, KNOW may differ depending on the setting.
4. Watch a conversation from the Kansas or Louisiana segments of the DVD. Identify what signers do to indicate they want to take the floor. Identify the ways a signer keeps the floor when someone else attempts to interrupt.

UNIT 25

Bilingualism and Language Contact

Bilingualism and contact between languages is another important area of socio-linguistics. François Grosjean, who has done research on bilingualism, has stated that “bilingualism is present in practically every country of the world, in all classes of society, in all age groups; in fact, it has been estimated that half of the world’s population is bilingual” (1982:vii). W. F. Mackey, another researcher, observed that “bilingualism, far from being exceptional, is a problem which affects the majority of the world’s population” (1967:11). Obviously, bilingualism is an issue that is of interest to deaf people all over the world, for two reasons:

1. It is almost impossible for members of a deaf community not to have contact with the majority language of the country in which they live. In fact, most often they have been forced to learn that language in its spoken and written form while use of their natural sign has been forbidden. Deaf people almost always live in a situation of bilingualism and language contact.
2. Most of the research on bilingualism and language contact in the deaf community has focused on contact between the spoken language of the community at large and the natural sign language of the deaf community. However, the opportunity for language contact between natural sign languages has been increasing as the members of different deaf communities around the world begin to interact with each other. The results of this language contact are very interesting and deserve a lot of research attention.

THE REASONS FOR BILINGUALISM

Bilingual situations happen for many reasons. One main reason is that individuals or groups of people who speak one language move to an area where another language is spoken. This can happen as the result of military invasions or colonization. For example, English and French are spoken in many countries of the world as the result of colonization; the Romans invaded Britain many centuries ago and brought Latin with them; and Spain colonized South America beginning in the fifteenth century and brought Spanish.

People also move for social or economic reasons. In Europe, many “guest workers” have moved from Italy and Turkey to Germany and Sweden to find work, and have brought their native languages with them. Following the end of the war in Vietnam, many people from Southeast Asia came to the United States, bringing with them languages such as Cambodian, Hmong, and Vietnamese. More recently, many Soviet citizens have emigrated to Israel, bringing Russian with them. Some people move for reasons of trade and commerce. One of the earliest examples would be the Portuguese-speaking sailors who traveled to West Africa in the sixteenth century, coming in contact with different African languages.

Bilingual situations also come about through nationalism and political federalism. This has happened in many countries upon gaining independence from the European nations that colonized them. The newly independent nation chooses a national language to be used for education, government, newspapers, and so forth. A bilingual situation comes about because many people learn the national language but also want to keep their native language. Countries where this has happened include India and Nigeria.

Education and culture can also result in bilingualism. For example, the language of education in Europe during the Middle Ages was Latin, and educated people knew both their native language (e.g., French, Italian, or Spanish) as well as Latin. For many years before the revolution in Russia, the language of education and culture was French, and most educated people knew both Russian and French.

Urbanization and intermarriage can also result in bilingualism. When people from the country move to the city to find work, they may have to learn the language of the city. In Guatemala, for example, many people who live in the country speak one of twenty-two different Indian languages. If they move to a city or a big town to find work, they may have to learn Spanish, the official language of the country. Likewise, a speaker of one language may marry a speaker of another language, and they may learn each other’s language.

In a deaf community, bilingualism comes about in different ways. In the American Deaf community, people who have Deaf parents learn ASL as their native language and English as a second language both from their parents and in school. However, for many years teachers and deaf students were not permitted to use ASL in classrooms. The language emphasis was either spoken English or some form of what we call sign-supported speech, that is, spoken English with signs added. Many deaf children have learned ASL from their peers in residential schools. Still other children have learned to sign from the interpreter provided to them in mainstream programs. Some deaf children do become bilingual in ASL and some form of English, but many deaf people do not become bilingual until they are adolescents or adults.

Maintained Bilingualism

When two languages happen to be used in the same location, they may both stay, or one of them may gradually disappear. The situation where they both stay is called *Maintained bilingualism*. In one case, two separate monolingual communities can exist close together with some contact, as with French and English in the province

of Quebec in Canada. In this situation, not everyone speaks both languages. Maintained bilingualism may also mean that everyone is bilingual and that the languages serve different purposes in the community. In Paraguay, for example, two languages are used—Spanish and Guaraní, an indigenous language. Almost everyone speaks both. They use Spanish for official purposes, such as school and government, and use Guaraní at home and among friends. The situation in the American Deaf community is generally one of maintained bilingualism. Most deaf people know some form of English and ASL.

Sometimes, bilingual situations result in a return to monolingualism. The second language may disappear, and the first may stay as it did following the Germanic invasions in Italy many centuries ago when the Germanic languages disappeared and Latin stayed. In other cases, the first language may disappear, and the second may stay. This has happened in the American West with many Native American languages that now have given way to English. One final situation may occur as a result of bilingualism: a new system may evolve through the processes of pidginization and creolization. The social conditions that usually accompany the emergence of pidgins and creoles are very special. Many people have suggested that there is a kind of pidgin in the American Deaf community, but we disagree with this perspective.

LANGUAGE CONTACT BETWEEN SIGNED LANGUAGES

Lexical Borrowing

When two languages are in contact, the languages may borrow words from each other. This is called *lexical borrowing*, and it occurs in both spoken and signed languages. English has borrowed words from Italian (pizza, spaghetti, ravioli), Arabic (algebra, coffee), French (quiche, bouquet), American Indian languages (tobacco, squash), and many other languages. Similarly, ASL has borrowed signs from other sign languages. The best examples are the signs for the names of countries (see Figure 98). This borrowing is the direct result of American deaf people coming in contact with deaf people from other countries. Another example is the sign CLUB, which was introduced at the Deaf Way conference in Washington, DC, in 1989 (see Figure 6 on p. 9). The sign was adapted from a sign used widely in Europe meaning “deaf club,” and it responded to the need for a sign that could readily be used and understood by the 5,700 conference participants from around the world.

Deaf people from different countries are interacting with each more often than ever before. As a result of increased contact and interaction, they have begun to borrow signs from each other, and this is how lexical borrowing is distinct from fingerspelling. Lexical borrowing involves borrowing whole signs, while fingerspelling is the manual representation of writing systems.

Code-Switching

Code-switching happens when a bilingual person is using one language and then switches to another language. The switch may be just one sign or it can be a part of



Figure 98. Examples of borrowed signs.

a sentence, a whole sentence, or a whole paragraph. This might happen if a native signer of LIS switched to ASL for part of a sentence, and then switched back to LIS. Generally with code-switching, the forms do not change; they are not incorporated into the other language.

Foreigner Talk

Foreigner talk may occur when the user of one sign language (Signer A) is signing with the user of another sign language (Signer B). Suppose Signer B is trying to learn Signer A's sign language or does not know it well. Signer A may simplify her language so that Signer B will understand. She does not include signs from other languages; she just simplifies her own language for the foreigner.

Interference

Interference may happen when a bilingual person unconsciously uses parts of one language in another language. The signer may use a handshape or a movement that is not part of the language he is using, simply by accident.

Pidgins, Creoles, and Mixed Systems

Theoretically, contact between two sign languages can result in pidgins, creoles, and mixed systems. Researchers disagree as to what the words *pidgin* and *creole* mean, but there does seem to be some agreement that the conditions under which they occur are special. Usually a pidgin is the result of language contact between the adult users of mutually unintelligible languages. The language contact occurs for very specific purposes, like trade. These adult users are usually not trying to learn each other's language but, rather, a third language (such as English) that will help them improve their social and economic status. Often, they are removed from the situation in which they can continue to be exposed to their first language. They also may have restricted access to the language they are trying to learn and may end up learning it from each other. This was the sociolinguistic situation during the slave trade in West Africa and the West Indies, when many pidgins emerged.

The pidgins that emerge from these situations seem to share many linguistic features, including a greatly reduced morphology and syntax. Many linguists agree that when children are born in these situations and learn the pidgin as their native language, they begin to change it and make it more complex. The result is what linguists call a *creole*. Although such a situation has not yet been observed in signed languages, it is possible to imagine a scenario like the following in the American Deaf community: Two signers of different sign languages are in contact and are trying to learn ASL, but basically only have access to ASL through each other; they are also removed from their native sign languages. The outcome of their interaction might look like what linguists have called pidgins. A final possibility is what linguists called a *mixed system*, a language resulting from language contact that combines elements of both languages.

LANGUAGE CONTACT BETWEEN SIGNED AND SPOKEN LANGUAGES

When language contact occurs between a signed language and a spoken language, we make a further distinction between *following spoken language criteria literally* and *unique phenomena* (see Figure 99). When following spoken language criteria literally, a signer who code-switches from ASL to English will literally stop signing ASL and begin speaking English, or vice versa. This occurs when a deaf person signs ASL with a bilingual hearing person and then puts down her hand and says an English word, maybe for emphasis; it also happens when a hearing bilingual who is speaking English to another hearing bilingual stops speaking and uses an ASL sign.

Sign and spoken language may also borrow from each other, following the literal definition for borrowing. For example, the ASL signs BOY FRIEND, GIRL FRIEND,

| <i>Contact Between Two Signed Languages</i> | <i>Contact Between Signed Language and Spoken Language</i> |
|---|--|
| Results in: | Results in: |
| Lexical borrowing | Following spoken language criteria literally: |
| Code-switching | Code-switching |
| Foreigner talk | Lexical borrowing |
| Interference | |
| Pidgins, creoles, and mixed systems | |
| | Unique phenomena: |
| | Fingerspelling |
| | Fingerspelling/Sign combination |
| | Mouthing |
| | Code-switching |
| | Coda talk |
| | Contact signing (code-mixing) |

Figure 99. Outcomes of language contact. Adapted from C. Lucas and C. Valli, *Language Contact in the American Deaf Community* (1992): 26. San Diego: Academic Press.

HOME WORK, HOME SICK, and BLACK BOARD are all examples of English compounds that have been borrowed into ASL. Conversely, hearing bilinguals may take the mouth configuration from an ASL sign and turn it into an English word. For example, the mouth configuration that is part of the depiction meaning “large pile of papers” or “thick book” can be glossed as “cha.” We have heard this used by hearing students in the sentence “I have cha homework.”

Unique phenomena seem to occur only as a result of the contact between a sign language and a spoken language. Fingerspelling, for example, is unique. As we pointed out earlier, fingerspelling is a representation with ASL forms of the orthographic system of English. Some researchers have said that fingerspelling is an example of borrowing, but borrowing is a relationship between two *phonologies*, be they signed or spoken. We have seen examples of borrowing between two sign languages. But fingerspelling is a relationship between the *phonology* of a sign language and the *orthography* of a spoken language, and the forms are always part of the sign language. Sometimes signers produce combinations of fingerspelling and signing, as in the sign LIFE#STYLE or the phrase #TAKE-CARE-OF.

Another unique phenomenon is *mouthing* of English words, distinct from the mouth configurations that are part of ASL signs. Davis (1989) discussed the difference between full English mouthing, where the word is essentially pronounced without voice, and reduced mouthing, where the word is not fully pronounced. Davis also described *lexicalized mouthing*, such as the mouth configurations in the signs FINISH or HAVE, which clearly derive from the English pronunciation of those words but have become part of the ASL signs.

A fourth unique phenomenon is the code-switching that may occur between ASL and one of the invented systems for coding English manually, such as SEE 1 or SEE 2. We describe this as a unique phenomenon and not as contact between two sign languages since these codes are not natural sign languages and are heavily influenced by the structure of spoken languages. We can imagine a situation, for

example, in which a signer might switch from ASL to SEE 2 to represent a quote in English.

Contact signing is also a unique phenomenon. Contact signing results from the contact between English and ASL and has features of both. This is what has traditionally been called Pidgin Sign English (PSE) in the American Deaf community. We have done a lot of research on this kind of signing. We don't use the term *pidgin* because this kind of signing does not seem to have the linguistic features of what linguists call pidgins, and the social situations in which contact signing is used are not like the ones in which spoken language pidgins come about, as we explained earlier. We have seen contact signing being used not only by deaf people with hearing people, but also by deaf people with other deaf people. Its linguistic features include English word order, the use of prepositions, constructions with *that*, English expressions, and mouthing of English words, as well as ASL nonmanual signals, body and eye gaze shifting, and ASL use of space. It may also include the other unique phenomena we have mentioned (i.e., fingerspelling and combinations of fingerspelling and signs).

A distinct version of contact signing occurs among hearing people who have deaf parents (children of deaf adults or Codas). Their *Coda talk* combines features of ASL and spoken English in a way unique to those who are hearing but whose parents are deaf and for whom ASL is a native language. In a recent analysis of written correspondence between Codas, Bishop and Hicks (2005, 2008) found evidence of the influence of ASL grammar on the way Codas write in English, including dropping of determiners and the verb *to be*, and using English descriptions of signs rather than the equivalent English words (for example, writing "fork-in-throat" instead of *stuck*).

One important thing to keep in mind about contact signing is the wide variety of the language backgrounds of the people in contact situations. Everyone is unique, and so what happens in each contact situation will be unique. The contact signing produced by a hearing bilingual who is a native English speaker will be different from the contact signing produced by a deaf bilingual who is a native ASL signer. Their contact signing may share some of the same features, but it may not be identical in its structure. It is also possible for signers to switch during a conversation from ASL to contact signing or from contact signing to ASL. Again, we consider this to be unique, as contact signing itself is the result of contact between English and ASL.

The contact between two sign languages is different from the contact between a sign language and a spoken language. Quinto-Pozos (2007) talks about three factors that play a role in the contact among sign languages. The first is the prevalence of *iconicity* in sign languages. All sign languages contain a lot of iconicity, and studies have shown that because of it, deaf people can quickly understand sign languages they have never seen before and can communicate fairly easily with the users of other sign languages.

The second factor is the *use of gestural resources*. Many of the gestures used by hearing people are found all over the world—the thumbs up or F handshape for "OK!"; a twisting B handshape, palm down, for "so-so"; and the wagging 1 hand-

shape for negation. Deaf people recognize these gestures and may have incorporated them into their sign languages, so they understand them if a deaf person from another country uses them.

The third factor is the *similarity in structure* of sign languages across the world. Research since 1960 has shown that sign languages share many elements of structure, unlike spoken languages, which can be radically different from each other. Deaf people from different countries share a basic understanding of the use of the signing space, depiction verbs, nonmanual signals, and so forth. This is very different from what happens when a speaker of English, which has a relatively simple morphology, encounters a speaker of Russian, which has a very complex case system, or a speaker of Chinese, which uses a system of tones to distinguish meanings. Sign languages have a lot in common and this makes a difference when their users come into contact with each other.

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UNIT 26

Language as Art

ASL is not used only for everyday communication. Artistic forms such as storytelling (which includes A-to-Z stories, number stories, and stories with depicting verbs), percussion signing, drama, comedy, poetry, and film have long existed in the Deaf community. The artistic forms of ASL have played an important role in the transmission of culture and history from generation to generation of Deaf people. The artistic forms of ASL are often quite distinct in their structure. For example, storytelling, a popular art form among Deaf people, demonstrates a complex structure that includes the extensive use of formulaic elements.

STORYTELLING

Storytelling is a fundamental part of Deaf culture. As with spoken language stories, ASL stories can be fables, personal experiences, anecdotes, or legends. Ben Bahan's "Bird of a Different Feather" (1992) is an excellent example of a fable. It tells the story of a singing bird who lives in the world of eagles and struggles to live up to their expectations. It very much applies to Deaf people's common experience of being raised with hearing people's expectations. "For a Decent Living" by Sam Supalla (1992) is a good example of a legend about a Deaf young man's dramatic fate. Like many other anecdotes and personal stories about funny experiences with house parents and teachers at residential schools, it also contains "paving the way" experiences—situations in which the Deaf hero of the story paves the way for other Deaf people through his pioneering experience.

A-to-Z Stories

A-to-Z stories (also called ABC stories) have been passed down through the generations dating back to the nineteenth century. In an A-to-Z story each sign represents one of the twenty-six handshapes in the manual alphabet, from A to Z. The stories cover a wide range of topics, including an operation, a haunted house, a romantic couple, a car race, and a basketball game. The transition from A to Z

must be very smooth, as in a regular story. A-to-Z stories are not easy to translate into English since their meaning depends on the visual effect created by the alphabet handshapes. The following example illustrates a classic A-to-Z story about a car race:

| Handshape | Equivalence |
|-----------|--|
| A | A driver gripping the steering wheel; |
| B | the back of the race car being raised, still not moving forward; |
| C | lights being flashed from top to bottom real fast; |
| D | the front of the race car being raised up as it is spinning; |
| E | the sound effect for the screeching tires, EEEEEEEEEE; |
| F | the audience's eyes following the race car that zooms off; |

And the story continues until it ends with the Z handshape. Some very creative stories can also be told from Z to A!

Number Stories

Number stories are similar in form to A-to-Z stories. Each sign includes a handshape that represents a number from 1 to 15 or higher. A clever short, sharp, slap story, “Got it?!” starts with the sign for “hey you” made with a 1 handshape, followed by LOOK-AT-ME with the 2 handshape, TERRIBLY-LOUSY with the 3 handshape, and continues up to 11 where it ends with GOT-IT?! After several repetitions, the audience members finally understand what the narrator was trying to tell them about the hidden numbers and they nod, “Got it!” Stories can also be created with A-to-Z handshapes and numerical handshapes together.

Stories with Depicting Verbs

Storytelling using depiction is a very rich, creative art form. One of the many classic depiction stories is about a golf ball. In this story the storyteller’s head represents a golf ball. It creates a point of view as it is put on a tee and watches a club approach several times before it is hit. After the ball is hit, it flies high over the trees, and then it descends and lands on the ground, bounces, rolls slowly, and finally stops. It is hit again, rolls toward the cup, and circles the rim of the cup before going down into the hole. Many funny visual images are created in this story.

PERCUSSION SIGNING

Percussion signing consists of using only one instrument, such as a bass drum, to beat rhythmic vibrations that Deaf people can feel while a performer signs with the beats. The beats are linked to the movements of the signs. Percussion signing started in the 1940s at Gallaudet University football games when it was performed for the song of the Gallaudet mascot. Now this art form is growing. It also can be done without an instrument, relying on the clapping of hands to create the rhythm

for the performer. This kind of percussion signing was seen at the Deaf President Now events at Gallaudet University in 1988.

DRAMA

ASL plays and skits probably emerged in the mid-nineteenth century in the residential schools (Lane, Hoffmeister, and Bahan, 1996). Dramatic performances flourished in the twentieth century in Deaf clubs, Deaf colleges, Deaf theater groups, Deaf TV/film production groups, and Deaf celebration groups. Drama in ASL is characterized by large and rhythmic sign movements and clear visual facial information such as facial grammar (questions, adverbs, conjunctions, and so forth) and emotions.

In the early 1970s, the National Theatre of the Deaf debuted an original ASL play called *My Third Eye* about ASL and Deaf people, and it was a huge success. Regional Deaf theaters have sprung up around the U.S., including the Onyx Theatre (New York City), The New York Deaf Theatre, Cleveland Signstage Theatre, Deaf Bailiwick Artists (Chicago), and Deaf West Theatre (Los Angeles), as well as in college theaters at Gallaudet University and the National Technical Institute for the Deaf. There have also been efforts to create original productions in ASL. For example, *Tales from a Clubroom* by Bernard Bragg and Eugene Bergman, *Institution Blues* by Don Bangs, and *Broken Spokes* by Willy Conley have been produced in local and college theaters.

Deaf actors also have appeared in mainstream theater productions. Phyllis Frelich won the Tony Award for Best Actress in 1980 for her portrayal of Sarah in *Children of a Lesser God*, and she appeared in the 2004 revival of *Big River*. Tyrone Giordano played Huck Finn in this production, and Linda Bove and Deanne Bray both appeared in the touring companies. Both of these productions had mixed deaf/hearing casts.

DEAF HUMOR

Deaf humor developed in the Deaf community partly as a way of coping with the oppression Deaf people face in the hearing world. ASL comedy amuses Deaf audiences. It includes funny stories, jokes, sketches, and other similar forms that make people laugh. One classic example of a funny story goes like this:

A crowd goes crazy when a deaf giant comes into town. He spots one woman lying down frightened, comes toward her, and gently lifts her onto his huge palm. She lies motionless on his palm, still frightened. The giant says, “You are so beautiful! I want to marry . . . !” The audience laughs, knowing that the woman is smashed to death when the giant signs MARRY, as the active hand moves fast and hard toward the palm. Then the giant says, “Oh uh . . . oral is better, oh well.”

This statement is very ironic and is intended to make Deaf people giggle uncomfortably since they know about the history of oral oppression.

Mary Beth Miller is a well-known comedienne. One of her more popular routines involves her “live” hands that fight each other in ASL. It is really masterful when she, the right hand, and the left hand are in turmoil. For example, the left hand protests that the right hand is being used most of the time and the left hand thinks this is not fair, so it won’t cooperate with the right hand. This gives Mary Beth some trouble and she scolds the hands for their silly behavior. The skit goes on and on and it really makes the audience laugh very hard since they know the use of both hands is important in ASL.

Two ASL comedians, Charles McKinney and Al Barwiolek, formed a comedy team (CHALB) that had much success and performed in many places all over the world during the 1980s and 1990s. One of their most famous shows was called *Deaf Pa What?* It was about Deaf people’s habits in the Deaf world. In one sketch they exaggerated Deaf people’s “long good-bye”: They put on coats and hats, indicating they are about ready to leave, but they continue chatting for another half hour. Then they realize they must go, but again they continue chatting for a half hour or more with coats and hats on. This is a big hit with all audiences in the Deaf community because it is so much a part of Deaf people’s daily lives.

POETRY

ASL poetry emerged in the 1970s and is a fast developing art form. It is believed that from the 1840s (when residential schools flourished in the U.S.) to the 1960s (when William Stokoe recognized ASL as a language), there were some ASL poets, but they went unrecognized because of the oppression of ASL and the inability to document signs and sign performances. In the 1970s, videotape equipment became widely used, and, as a result, it became possible to record and preserve ASL and ASL poetry. Several ASL poets—Patrick Graybill, Ella Mae Lentz, and Clayton Valli—published their works on tape in the 1990s.

In *Deaf in America: Voices from a Culture* (1988), Carol Padden and Tom Humphries discuss rhythm of movement in two ASL poems, “Eye Music” by Ella Mae Lentz and “Windy Bright Morning” by Clayton Valli. They describe the rhythmic quality in both poems in an effort to point out how movement can express notions like harmony, dissonance, and resonance differently in poetry than in ASL prose.

Valli (1996) also explored the features and functions in prose and poetry in ASL. At the phonological level, signs in prose are not specifically chosen for phonetic form. However, signs in poetry are chosen for specific phonetic form (physical image) to accomplish rhyme, rhythm, and meter; the signs also are more flexible in regard to changing of phonetic parameter(s). The morphological and lexical features are treated quite differently. Signers can create a new sign by compounding, inventing, borrowing, and other processes, but new signs generally must be approved by the community through use. Poets, on the other hand, can create new signs through invention. The new sign is created by the poet and does not require a history of use by the Deaf community. As for syntactic features, depiction in prose tends to be used after identifying arguments of the verb. This is not so in

ASL poetry, where depiction often is used without explicitly identifying arguments. Gilbert Eastman, an ASL poet and performer, uses a lot of depicting handshapes and physical images in his poem about the historic and dramatic Deaf President Now movement, “DPN Epic.” This poem shows clearly that ASL poetry is very different from ASL prose.

Poetic Features

ASL poetry contains the same features found in spoken language poetry—rhyme, rhythm, and meter (Valli 1996). All of these features are found in Clayton Valli’s poem, “Dandelions,” on the DVD. We see several different kinds of rhyme in this poem. For example, the signs indicating the quantity of flowers and the flowers swaying in the breeze have the same 5 handshape. The signs showing the angry man pulling the dandelions and mowing use an S handshape. Later in the poem, we see that the rain and the sun have the same 5 handshape. This is called *handshape rhyme*. The signs showing that the flowers close overnight repeat a circular movement, illustrating *movement path rhyme*. The same location is also repeated, showing *location rhyme*, and the poet repeatedly looks left and then right and repeatedly puffs his cheeks, showing *NMS (nonmanual signal) rhyme*.

Rhythm in ASL poetry is created in a variety of ways: movement paths, assimilation, change of a sign, choice of a sign, handedness, alternating movement, movement duration, and movement size. The rhythm in our example is dominated by enlarged movement paths and use of handedness.

Meter is a count of something we can see. The essence of meter is the contrast between heavy and light syllables. We see this kind of meter in the example. They are *pentametric* (five feet in a line). The first signs in each line are *double-spondaic*. A spondaic foot shows equivalent stress in both of the syllables. The second signs in each line are *double-trochaic*. A trochaic foot consists of a stronger syllable followed by a weaker syllable. The last signs in each line are *iambic*, a weaker syllable followed by a stronger one. As you can see, the meter of ASL poetry depends heavily on visual movement.

FILM

Film is not new to the Deaf community. In fact, ASL has been in films for more than a century. “The Preservation of the Sign Language,” signed by George Veditz, the president of the National Association of the Deaf, in 1913, became one of twenty-five films selected by the Library of Congress in 2010 to be included in the National Film Registry (Gallaudet University 2011). Veditz signed in noticeably large, slow motions within a frame that left much space surrounding his body. At the time, the limitations of the medium were still uncertain, and film was extremely expensive. Deaf filmmaker Ernest Marshall produced feature films between 1937 and 1963 in which all the actors used ASL. Another example of Deaf film production, *Think Me Nothing* (1975) by Peter Wolf, represents the strong core of the Deaf world.

As technology has evolved, ASL signers have appeared in every type of film, TV show, and, more recently, self-produced videos uploaded through sights such as YouTube. Beginning in the 1980s, deaf actors began to appear in mainstream film and television productions. Linda Bove was a regular on *Sesame Street*; Howie Seago had starring appearances in several television series, including *Star Trek: The Next Generation*, and in films; Marlee Matlin performed the role of Sarah in the film version of *Children of a Lesser God*, for which she won an Academy Award, and she has appeared in numerous films and television programs; Phyllis Frelich starred in the television film *Love Is Never Silent*, and has had roles in many television series; Julianna Fjeld coproduced and appeared in *Love Is Never Silent* and won an Emmy for producing the film; and Deanne Bray has made guest appearances in various television series, in addition to starring in the series *Sue Thomas: F.B.EYE*.

Many of the films created each year worldwide that portray sign language, Deaf culture, and Deaf individuals do not receive wide or mainstream distribution. Representations range from Deaf actors portraying people in everyday life, such as in *Gerald*, to the British mockumentary about a Deaf porn star and his amazing hand capabilities in *Hands Solo*. However, there have been an increasing number of international as well as national Deaf film festivals.

Film content, similar to art, poetry, and theater, generally portrays topics of cultural significance. However, unlike these other artistic expressions, film is closely connected to technology, and the rapidly changing ease of accessibility and affordability of new equipment has had some of the greatest impact thus far on the Deaf community. Feature filmmakers and individuals are experimenting with editing and filming techniques to present new portrayals of ASL. Time will reveal what impact, if any, such technological advancements might have on the linguistics of ASL.

Cinematic expression is deeply imbedded into Deaf cultural and linguistic expression. It is rife within storytelling, poetry, and everyday conversation. Highly skilled signers use elements of cinematic “editing” almost constantly and with remarkable execution. Prime examples include filmmaker and orator Sam Supalla’s “Best Whiskey in the West” and Ben Bahan’s more commonly known “Bird of a Different Feather.” In the opening scene of his story, Bahan signs a close-up of an egg moving, then the eye gaze of both parents shifts toward the egg while their facial expressions show anticipation and excitement. The egg moves again. The parent on the left glances at the other parent, which is shown through eyeball movement, then looks back to see the egg moving, cracking, and a head popping out like a jack-in-the-box. Bahan continues to describe specific features of the face, such as the short beak, huge eyes blinking, and so forth, all through the creation of carefully depicted “shots.”

The seemingly simple sequence of Bahan’s story would require many different edited shots if it were told on film, making it difficult to execute without overwhelming an audience. This kind of ingrained cinematic awareness and ease of execution by skilled Deaf signers is why a genre such as film should be full of Deaf individuals. Through Internet sites that host video content, such as YouTube, individuals within the Deaf community are posting creative short stories and signed translations

of songs, as well as exploring the capabilities of film and editing to see what can be accomplished.

SUMMARY

One of the major aims of studying the artistic uses of ASL is to help learners discover the richness of the language, its multiple meanings, its enormous flexibility, and its complicated and very useful structures. Thus, this knowledge is the gateway to success in education and careers as well as to full participation in our bilingual/multicultural society.

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Homework Assignment 20

1. Think of a significant event that has taken place in your life, something that you may have told other people about before. Organize your thoughts into a story that you can present to your class. This is different from just telling someone about an event during a conversation—what you are preparing is more like a performance. As you rehearse your story, you may want to videotape yourself so you can see clearly what your story looks like and which parts you may want to change. Memorize your story and perform it for your class.
2. Analyze your story and describe how your presentation is different from just telling someone about the event during a conversation. Look at specific features such as the use of space, eye gaze, sign choice, speed and size of signing, handedness, possible repetition of signs and phrases, and so forth. What is the structure of your story? Does it have a clear beginning, middle, and end? How many parts does it have and what is the function of each part?
3. Watch the poem entitled “My Favorite Summer House” on the DVD and identify examples of different kinds of rhyme: handshape, location, movement, and NMS.
4. Explain the meaning of the poem “Dandelions” on the DVD. What is it about and what is its message?

PART
SEVEN

SUPPLEMENTAL READINGS

Analyzing Signs

ROBBIN BATTISON

Sign language and speech are superficially unlike each other, since one involves a manually produced, visually received signal, while the other involves an orally produced, auditorily received signal. If we are to look for common features in the form of speech and sign behavior, then we must explore the organization of signs at a level general enough to permit some comparisons to spoken words. This necessitates a re-examination of the function of the phonological component of a grammar.

1.1 SUBLEXICAL STRUCTURE

The goals of a complete phonological description are to establish three interdependent aspects of linguistic form: (1) the sublexical analytical units which in combination with each other make up the morphemes of the language; for spoken languages these components would be segments (phonemes in the structuralist framework) described in terms of distinctive feature specifications (not to exclude tone, stress, etc.); (2) the allowable and non-allowable patterns of distribution of these units, whether stated at a deep underlying level by morpheme structure constraints, or at the surface level as the result of phonological rules and morphophonemic alternations; (3) the patterns of historical changes occurring over time; and (4) to link the above components, rules, and

patterns of alternation with the physical or phonetic framework, and to seek motivation for these structures and constraints in the articulatory and perceptual processes which encode and decode the forms of the language.

What this adds up to is a set of rules and constraints that limit the possible forms which may be used in a given natural language to express meaning. For spoken languages, we may take the universe of forms to be the entire range of sounds produced by the human vocal apparatus, only a small set of which are potential human speech sounds. The phonology of a particular spoken language would further circumscribe this set, delimiting a finite set of sound elements combinable according to a set of rules and constraints to yield the allowable morphemes of the language, plus their alternative forms when used in strings (phrases or sentences).

For sign languages the task is analogous. Out of the entire range of gestures that it is possible to make with the human body (particularly torso, head and arms), the phonology of a sign language must specify the possible signs of a given sign language, and also specify their form when used in strings. In this sense a gesture is not necessarily a sign, but every sign is also a gesture.

I will continue to use the word “phonology” to refer to the analogous level of

Source. Reprinted by permission of the publisher, from R. Battison, *Lexical Borrowing in American Sign Language* (1978):19–58. Silver Spring, MD: Linstok Press. The references for this reading can be found in the original volume.

abstract structure in sign languages. Stokoe (1960) coined the term “cherology” to apply to much the same area. I choose to avoid this term for three reasons: (a) to avoid confusion between Stokoe’s structural analysis and the present study, which is cast in a generative phonological framework; (b) to avoid using a new term where a familiar one seems both adequate and appropriate; (c) to highlight existing similarities between speech and signing.

The units of analysis posited by Stokoe still have a great deal of validity, however, and have been used by subsequent researchers in the field. He noted that signs in ASL required three different types of information about simultaneously occurring events to specify their information and to distinguish them from other signs. He refers to these as the *aspects* of a sign so as to avoid unnecessary confusion with a *sequence* of segments (Stokoe 1972):

- a. The *location* of the sign in relation to the body, which Stokoe termed the *tabula* (or *tab*);
- b. The *handshape(s)* or configuration(s) of the hand(s) involved in the sign, called the *designator* (or *dez*);
- c. The movement executed by the hands, called the *signation* (or *sig*).

Besides the three aspects explicitly stated, Stokoe (1960) makes use of a fourth type of simultaneous formational information in his transcription system. This is the spatial *orientation* of the hands, in relation to each other and/or the rest of the body. Battison (1974), Frishberg (1974, 1975), Woodward (1973a), Woodward and Erting (1975), and others have since made orientation information more explicit in sign descriptions. Under this analysis, the lexical entry for each sign must be specified for each of these categories, and class relationships among signs can be stated in terms of shared

specifications. Each of these categories of location, handshape, movement, and orientation thus may be viewed as comprising a sub-set of elements which make the equivalent of a phonological inventory. These units were termed *cheremes* by Stokoe (1960) and *primes* by Bellugi (1972). Naturally the interaction and interdependence of these hypothetical units are as important as the units themselves.

Stokoe (1960) and Stokoe et al. (1965) posited 19 distinct hand configurations, 12 distinct locations, and 24 distinct movements as the basic manual components of signs. In addition, Stokoe’s (1960) analysis coded the passive hand of a two-handed sign as a location. In his structuralist analysis, independence of these units was based on their contrasting role in minimal pairs. All other variants of location, handshape, etc., were treated as “allochers” of these cheremes. At the more “phonetic” surface level there are many more possible distinctions, of course.

My own observations suggest that there are approximately 45 different handshapes and 25 different locations on the body or in space where signs are made. There are fewer different types of movements and orientations (perhaps on the order of one dozen each). Klima (1975) suggests that there are close to 40 significant handshapes, 12 locations, 16–18 orientations, and 12 simple movements. Newkirk (1975), in developing a transcription and orthography for ASL, noted more than 54 distinct handshapes, the remainder of his analysis not being comparable for enumeration.

The exact number of different primes depends upon more complete phonological and “phonetic” analyses than are now available, and depends upon the resolution of a number of descriptive problems. For one thing, there are many alternatives for coding the same type of information about the

physical nature of signs: Direct linear movement between two locations could be coded entirely in terms of those locations; finer points about manual contact could be coded by orientation and locations, or they could be coded separately, as in Friedman and Battison (1973); fine movements of the fingers are sometimes (but not always) equivalent to recognizable changes of handshapes; orientation could be just a cross-classifier of handshapes rather than having a status equal to handshape, movement, and location aspects. For another thing, the state of the art has advanced to the point where information on the psychological reality of sign phonology is only just beginning to emerge (Bellugi et al. 1975, Lane et al. 1976, Poizner 1976).

The important point at present is not how many primes there are in each of the four categories, but that there is some justification in assuming that there are four separate categories, that each category is composed of a finite set of distinct elements, and that every simple sign comprises a prime specification for each of the four categories which are to be articulated simultaneously. These assumptions, which demand a refinement going beyond the scope of this study, are sufficient to facilitate the present descriptions and discussions.

Besides describing the physical formation of signs, these primes serve to distinguish signs from each other, often minimally. Not all of these primes contrast at an underlying level of representation, as we shall see later. Minimal pairs of signs can be found that differ in form only in one particular aspect. For the aspect of handshape, there are pairs of signs which are identical in all respects except for the particular handshape involved. An example is the pair of signs CAR¹ and WHICH (Figure 1). The only difference between them is that CAR uses the standard A or S handshape² (compact fist, thumb

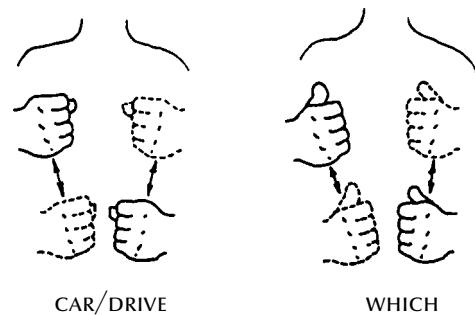


Figure 1.

closed against side or knuckles), while WHICH uses the Å handshape (compact fist, thumb extended).

In the case of location a minimal pair is CHINESE and SOUR (Figure 2). The two signs are identical except that CHINESE is made on the temple or high on the cheek and SOUR is made near the mouth.

A minimal pair for movement is found in NAME and SHORT (BRIEF) (Figure 3). NAME is made with simple contact (sometimes repeated) while SHORT (BRIEF) is made identically except for having a side-to-side brushing motion of the upper hand.

Finally, the pair NAME and SIT (CHAIR) differ minimally only by orientation. In the sign NAME, both *volar* (palm) surfaces are oriented more-or-less toward the body, and the fingers make contact on the edges. In

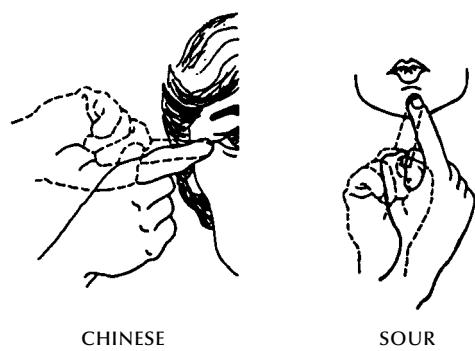


Figure 2.

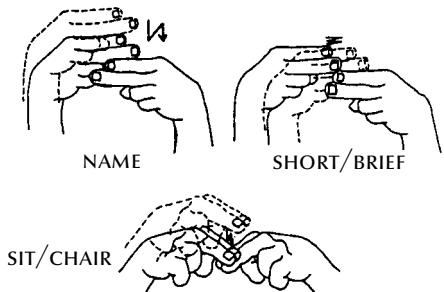


Figure 3.

SIT (CHAIR), both volar surfaces point downward.

What we have seen so far is the beginning of a sublexical or phonological analysis of signs. The four categories of location, handshape, movement, and orientation comprise classes of units which may serve to distinguish signs from each other. Before moving on to other combinatorial aspects of these units, we should consider the form of the articulator, the human body.

1.2 THE BODY AS ARTICULATOR

It may be helpful to dissociate ourselves from our bodies temporarily and to consider our bodies as machines capable of generating manual visual signs. For our purposes here, there are actually two basic ways of viewing the body as a machine—one in terms of production of signs and the other in terms of perception of signs. In terms of perception, the body is a bilaterally symmetrical object with a very complicated moving organ (hand and arm) on each side. However, in terms of production of signs and the actual usage of the body, observations indicate that signers tend to use one hand and one side of the torso much more than the other.³ It is a major thesis of this study that this opposition between potential visual symmetry and the actual manual asymmetry of the body creates a dynamic tension of great importance for

the formation of signs, and we shall return to it often.

In the context of this study we shall need three pairs of terms to discuss the components and activities of the left and right sides of the body. The terms *left* and *right* themselves are superfluous, since they are arbitrary labels for sides unrelated to function, and because the opposition of *left* and *right* is non-distinctive for signs—it carries no meaning. A one-handed sign means the same thing regardless of whether it is performed by the left or right hand (except for cases where the sign refers to something to the left or to the right), and a two-handed sign does not change meaning regardless of whether the left and right hands reverse their formation roles.

The term *dominant* will be used to refer to the hand preferred for most motor tasks, and *nondominant* will refer to the other hand. For descriptions of signs involving two hands, we shall use the functional terms *active* and *passive*. A two-handed sign may either have two active (moving) hands, or it may have an active and a passive hand. The active hand has a much larger role and executes a more complex motor program than its passive partner, which can be absolutely stationary. Under certain circumstances the passive hand may be in motion due to transitions from the previous sign, or due to moving up into signing space from one of the rest positions. This motion is of course quite variable and quite irrelevant for the sign itself, except when considering transitions between adjacent signs and their potential metamorphosis into compounds.

Signers can be characterized as being either left-handed with respect to signing or right-handed with respect to signing. For most signers with right (left) hand dominance, their right (left) hand will assume the active role most of the time. This is the natural, or unmarked, state of affairs. In special circumstances there is switching of the

hands (Battison 1974, Klima and Bellugi 1975, Frishberg 1976b).

A third pair of terms *ipsilateral* and *contralateral*, meaning same side and opposite side, respectively, are useful in discussing the orientation of signs with respect to where contact is made on the body. For signs which are not specified in terms of left or right, it is more germane to note which side of the body is touched in terms of *ipsilateral* (same side as that of the active hand) and *contralateral* (opposite side), rather than *right* and *left*. For example, in the American pledge of allegiance, the right hand contacts the contralateral breast; in a military salute, the right hand contacts the ipsilateral forehead or temple. Since we have already noted that left-right distinctions are superfluous to sign descriptions, the interaction between two articulators (body and hand), each having a left-right orientation, is easily described regardless of whether the left (right) hand touches the left (right)

side of the body—ipsilateral contact—or whether the left (right) hand touches the right (left) side of the body—contralateral contact.

1.3 TYPOLOGY OF SIGNS

Given the preceding definitions, perspectives on the body as a sign-generating machine, and proposed elements of formation, it is now possible to return to the discussion of the formal qualities of signs in isolation. Our first task is to propose a tentative classification based on distinct types of motor acts.

For the purposes of this discussion, we shall posit six mutually exclusive, exhaustive, types of signs:

Type Ø: One-handed signs articulated in free space without contact (e.g. PREACH, Figure 4).

Type X: One-handed signs which contact the body in any place except the opposite hand (CHINESE, SOUR, Figure 2).

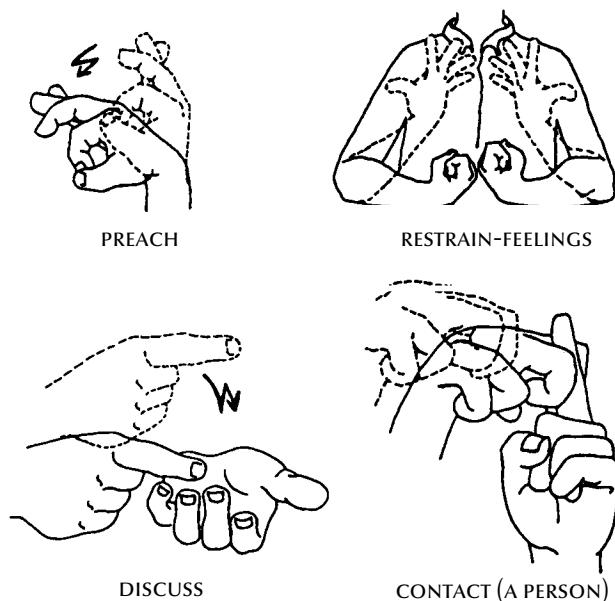


Figure 4.

Type 1: Two-handed signs in which both hands are active and perform identical motor acts; the hands may or may not contact each other, they may or may not contact the body, and they may be in either a synchronous or alternating pattern of movement (*WHICH, CAR*, Figure 1; *RESTRAIN-FEELINGS*, Figure 4).

Type 2: Two-handed signs in which one hand is active and one hand is passive, but both hands are specified for the same handshape (*NAME, SHORT/BRIEF, SIT/CHAIR*, Figure 3).

Type 3: Two-handed signs in which one hand is active and one hand is passive, and the two hands have different handshapes. Note that signs which were excluded specifically in Type X fit in Types 2 and 3—one hand contacts the other (*DISCUSS, CONTACT (A PERSON)*, Figure 4).

We shall also need to posit a sixth type, *Type C*, to account for those compounds which combine two or more of the above types.

Computing the frequency of types illustrates the opposition between the principles of symmetry and asymmetry. If one includes both one- and two-handed signs, then a majority of them are asymmetrical; if one looks only at the two-handed signs, most of them are symmetrical:

In a study of more than 2,000 signs of American Sign Language, we found that only 35% involve the use of both hands where both hands are active [type 1]. About 40% of the signs are made with one hand only [types Ø and X], and another 25% are made with one hand acting on the other hand which remains stationary as a base [types 2 and 3]. Thus, for almost two-thirds of these signs, one hand is used as the dominant hand. (Klima and Bellugi 1975:232)

This classification is not intended to be absolute and definitive, as there are other

bases for classification, e.g., type of movement (Supalla 1976, Grosjean 1977) or type of contact. But this classification allows us to relate signs directly to the relative complexity of certain motor acts. As discussion warrants, this general schema will be amended and refined.

Types 1, 2, and 3, the two-handed signs, are of greatest interest, since (apart from type C), they are the more complex signs and lend themselves more easily to relative measures of complexity. We can demonstrate the relative complexity of types 1, 2, and 3 by reference to Figure 5, which represents an idealized procedure for identifying the handshape specifications of a two-handed sign. Note that this is only a linguistic-analytic model and not a psycho-linguistic model. It merely reflects the amount of information coded into a two-handed sign according to the analysis of handshape specifications presented.

In terms of this model, the chain of questions which leads to the specification of the handshapes of a two-handed sign is more complex for type 3 than for type 2, and more complex for type 2 than type 1, where complexity is indicated by the number of questions. This is summarized in Table 1.

According to this model, type 1 signs can involve a greater amount of redundancy in that fewer questions are required to arrive at the specification for the two handshapes involved. Conversely, the greater number of questions required to specify both handshapes of a type 3 sign reflects a greater amount of internal structure, more complexity and less redundancy. Type 2 signs lie between these two extremes.

1.4 MORPHEME STRUCTURE CONSTRAINTS ON TWO-HANDED SIGNS

The information presented thus far on two-handed signs can be described in terms

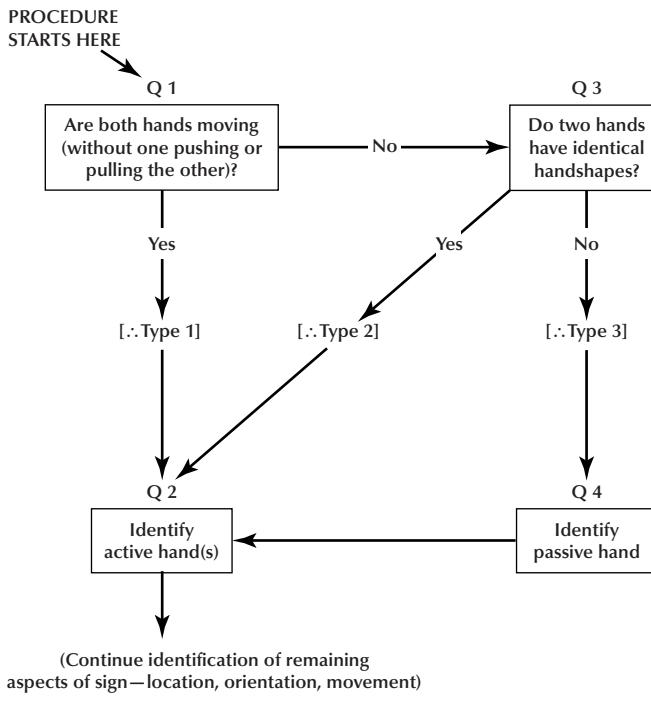


Figure 5. Idealized procedure for identifying the handshape specifications of a two-handed sign.

more compatible with linguistic descriptions, since they in fact reflect a hierarchy of constraints on the ways in which manual elements may combine to form sign morphemes. Simply by examining the descriptive definitions of types 1, 2, and 3, one can formulate two morpheme structure constraints stated over simultaneous primes which severely limit possible forms in a way which *excludes the more complex forms*. I call these two interlocking constraints the

Symmetry Condition and the *Dominance Condition* (an earlier description can be found in Battison 1974). Both of these constraints can be stated in the familiar if-then form of morpheme structure conditions of spoken languages—if a certain structural configuration or element is present in the morpheme, *then* certain other things must be present (or absent) also.

The Symmetry Condition states that (a) if both hands of a sign move independently

Table 1. Questions Required to Obtain Handshape Information on a Two-Handed Sign, Following Schema in Figure 5

| | Question (1) | Question (2) | Question (3) | Question (4) |
|--------|-----------------|-----------------|-----------------|-----------------|
| Type 1 | XX | XX | | |
| Type 2 | XX | XX | | XX |
| Type 3 | XX | XX | XX | XX |

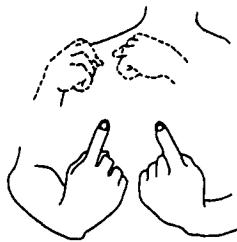


Figure 6. SINCE

during its articulation, then (b) both hands must be specified for the same location, the same handshape, the same movement (whether performed simultaneously or in alternation), and the specifications for orientation must be either symmetrical or identical.

“Same location” in this case means either (a) the physically identical location—both hands are actually in the same area; or (b) the hands are in mirror-image locations on either side of the line of bilateral symmetry. An example of physically identical locations would be the sign SINCE (also glossed UP-TILL NOW) (Figure 6), in which both hands start from the same corner of the upper chest and flip outwards. An example of (b) would be the sign WHICH (Figure 1) in which each hand is equidistant from the line of bilateral symmetry.

“Symmetrical orientation” can be defined as any orientation in which identical parts (any parts) of the two hands have mirror image orientations with respect to the plane which separates them. “Identical orientation” means that both hands have the same orientation with respect to the body (e.g., fingers pointed out from the body and palms down), but it says nothing about the orientation of the hands with respect to each other. Both SINCE and WHICH have symmetrical (and identical) orientations—identical parts of the hands “face” each other across the line which separates them. The sign

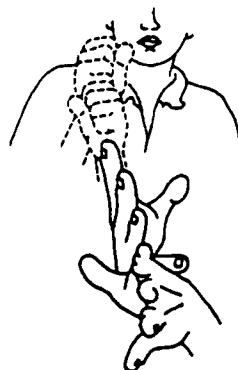


Figure 7. BE-PREPARED

BE-PREPARED (Figure 7) illustrates identical orientation without symmetricality: Both hands have volar surfaces contralateral, metacarpals outward, but identical parts of the hand do not face each other across the line which separates the hands.

Rephrased very informally, the Symmetry Condition amounts to saying: “If a two-handed sign is going to bear the added complexity of having both hands move, then both hands must perform roughly the same motor acts.” A large number of logically possible gestures in which two hands perform different motor activities are thus excluded from being potential sign morphemes.

The simple Dominance Condition, inversely related to the Symmetry Condition, states that (a) If the hands of a two-handed sign do not share the same specification for handshape (i.e., they are different), then (b) One hand must be passive while the active hand articulates the movement, and (c) The specification of the passive handshape is restricted to be one of a small set: A, S, B, 5, G, C, and O⁴ (Figure 8).

Type 3 signs obey this constraint with very few exceptions. In effect, the Dominance Condition rules that if a two-handed sign is so complex as to involve two different

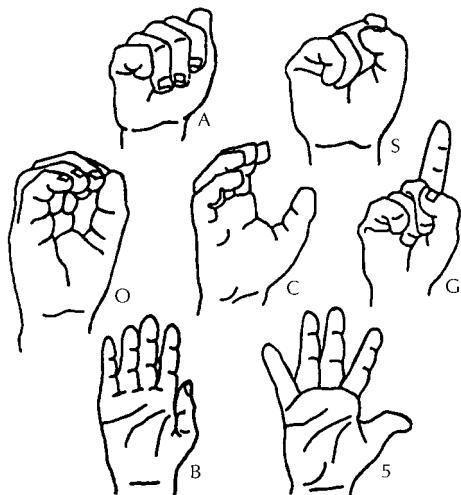


Figure 8.

handshapes, then the overall complexity of the sign must be reduced by (a) prohibiting movement of one hand (usually the nondominant) and (b) severely restricting the possible handshapes which may appear on this passive hand. The reduction from approximately 45 handshapes to a mere 7 greatly reduces the complexity of the sign and increases the redundancy, since a specification of one hand from among seven possibilities requires less information than a specification of one handshape among 45 possibilities. This constraint on complexity should tend to facilitate both the production and perception of such a complex sign. Looked at another way, the answer to question 4 of Table 1 does not carry as much information as the answer to question 2, since it chooses from among fewer possibilities.

Finally, it should be noted that the two-handed signs not delimited by either the Symmetry or the Dominance Condition constitute the in-between group, type 2, in which the handshapes are identical, but only one hand is active.

1.5 MARKED AND UNMARKED HANDSHAPES

The seven handshapes mentioned in reference to the Dominance Condition form an interesting group of critical importance. The first thing of note bears repeating: These particular seven handshapes may take the role of the passive hand in type 3 asymmetrical signs when dozens of others are proscribed. Secondly, a glance at Figure 8 suggests that these seven handshapes are maximally distinct, basic geometrical shapes. A and S are closed and maximally compact solids; B is a simple planar surface; 5 is the maximal extension and spreading of all projections; G is a single projection from a solid, the most linear; C is an arc; O is a full circle. They are thus the most basic possible handshapes, given these geometrical criteria, suggesting that they are maximally distinct in both articulatory and perceptual terms (with the exception of A and S, which are very distinct from the others, but very similar to each other).

There is also reason to believe that these seven are the most natural basic handshapes in a phonological sense also—i.e., that they are the unmarked elements in their set: (1) They have a high frequency of occurrence in a wide array of contexts (some of them exclusive contexts, as we have seen); (2) They are found in all other sign languages for which information is presently available to us; (3) They are among the first handshapes mastered by deaf children acquiring ASL from their parents (Boyes 1973, McIntire 1977); (4) In a visual perception experiment designed to test hypothetical feature analyses for 20 handshapes, Lane et al. (1976) found that the four hands least confused (i.e., most resistant to distortion by noise) were, in order, 5, B, C, and O, with A ranking 7th; (5) Children make production errors of handshape substitution which tend

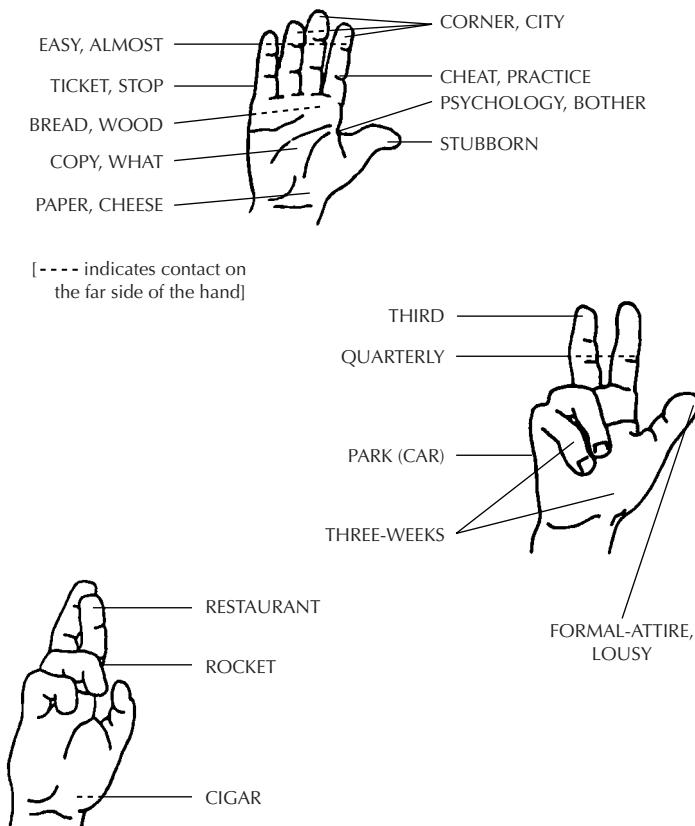


Figure 9. Comparison of potential points of contact of unmarked (B), intermediate (3), and marked (R) handshapes. (Glosses are examples of signs made by contacting these points.)

toward elements of this set (Boyes 1973); (6) This small set of unmarked handshapes functions less restrictively than other more marked handshapes—not only in terms of frequency as in (1) above, but in interaction with other elements of the sign: These seven handshapes have greater variety in how they may contact the body or the other hand in order to form signs; the more marked handshapes have greatly restricted points of contact (pointed out to me by Richard Lacy). Figure 9 compares the points of contact possible with an unmarked handshape (B), a handshape of intermediate status (3), and a highly marked handshape (R), which nearly always occurs in initialized⁵ signs. These seven handshapes predominate in signs

which require the active hand to change handshapes during the articulation of the sign. Of these 155 “dez-changing” or “double-handshape” signs, 136 (87.7%) have at least one unmarked handshape, and 98 (63.2%) change from one unmarked handshape to another (double-handshape signs are discussed in greater detail later in this chapter).

From the discussion thus far, it is evident that the complexity of handshapes individually and in simultaneous combinations are offset by quite stringent restrictions of distribution and co-occurrence. Unmarked handshapes have wider distribution and more freedom of co-occurrence than the more marked, more complex handshapes. The increased complexity of certain handshape combinations

in two-handed signs also prompts certain restrictions to balance out the complexity: Where both hands are required to move in a sign, they must perform identical or nearly identical motor acts—they cannot move independently within a given sign (Symmetry Condition). For those signs which require two dissimilar handshapes, one of the hands must be passive, and must be one of the seven most basic, unmarked handshapes (Dominance Condition).

This dynamic tension between increased complexity of some aspects of a sign and decreased complexity in other areas is a theme which will recur frequently in this study. It suggests that there are some relative, and perhaps absolute, restrictions on the allowable complexity of ASL signs. This is well illustrated by the preceding data on handshapes. In the following sections we shall consider additional evidence from locations, and from the number of beats in the articulation of individual signs.

1.6 MORPHEME STRUCTURE CONSTRAINTS ON LOCATION

The location aspect of signs is quite different from the handshape aspect, both in articulatory and perceptual terms. Handshapes are differentiated by the spatial configurations of the hand, involving the extension, contraction, contact, and divergence of the fingers. These relatively fine movements and configurations are acted out and displayed in an area of less than 50 square inches (the fully extended and open "5" hand of an average adult would not quite fill an area of 50 square inches). Fingerspelling, which relies almost totally on differentiation of handshapes, normally takes place in the region of the small circle in Figure 10 (shown for a right-handed person).

The manifestation and differentiation of the locational aspect of signs are necessarily



Figure 10. Fingerspelling (shaded) and signing areas.

grosser in many ways, since the extent of the space used is larger. Signs may be articulated freely in space, or they may involve contacting parts of the body. The general area in which signs are made is indicated by the large circle in Figure 10. Exaggerated signs, certain gestures, and pantomime may exceed these limits, but most signs would be made in this restricted area, which has been termed "signing space" by Bellugi (1972) and Frishberg and Gough (1973a).

The differentiations in location, whether on or off the body, are made within a much larger area than the differentiations for static handshapes. Obviously, there must be some compensation for this disparity in physical range. Three contributing factors act to balance out the motor-perceptual tasks on the relatively finely differentiated hand versus those on (or in front of) the more grossly differentiated body. The first of these is that the movements performed in this large signing space are performed by the brachial system, the movements of which probably cannot be as finely controlled or differentiated as

those of the digital system. Thus locational targets within this large space should be further apart. The second factor involves the visual backdrop of the body itself. Locations in signing space are not differentiable by relative distance alone, but by their proximity or relations to the gross landmarks of the body—the head, chin, shoulders, waist, etc.

Third, the entire signing space is not used uniformly. Certain areas allow greater complexity of motor acts. This can be shown in two ways:

(1) Measuring vertically we could compare the discrete levels on the body where signs are made. For this purpose we need only consider signs made by contacting the head, neck, or trunk (the "height" of signs made by contacting the arm itself is difficult to establish, since the arm is a mobile organ). Figure 11 shows the different heights at which various signs may contact the body. Not all of these height differences are phonologically distinctive, and for many of them minimal pairs cannot be found—but this is not crucial to the argument. It is apparent that greater vertical location differentiation

is possible as one moves from the waist to the head.

(2) We could gauge the relative complexity of handshapes occurring in signs made at these various levels. One approach to this problem would be to trace the relationship between the unmarked handshapes (A, S, B, 5, G, C, and O) and the height of the location of the signs in which they occur.

Table 2 shows the number of unmarked and marked handshapes occurring in signs in either of two major areas: The head (including 15 signs made on the neck) and the trunk (from shoulders to waist). The signs were taken from DASL (Stokoe et al. 1965), and included signs which are normally made in close proximity without contact.

The percentage of marked handshapes in the head area is certainly higher than the percentage of marked handshapes occurring in the trunk area—33.1% as opposed to 24.1% ($\chi^2 = 4.10$; d.f. = 1; $p < .05$). While this is a significant difference, but not an overwhelming one, we should note additionally that 33 of the 34 signs made on the trunk with marked handshapes either involved contact on the upper or central trunk alone (e.g., RELIGION, EGOTISTIC, VOLUNTEER) or involve both upper and lower trunk contact (e.g., KING, LORD). Thus Table 2 does not reflect the fact that the lower portion of the trunk is almost "off limits" to marked handshapes. [We should note that, although DASL was compiled with the aid of many data corpora, it makes no claims to be complete. As more signs come to the attention of linguists and lexicographers, the counts in Table 2 will surely change, although the proportional results are assumed to be correct.]

Thus it does appear that the vertical location component of signs is systematically restricted in a manner consistent with the need to keep visual elements perceptually



Figure 11. Vertical location distinctions.

Table 2. Number of Signs with Marked and Unmarked Handshapes Located in Two Major Areas

| | Unmarked Handshapes | Marked Handshapes | Totals |
|-------------------------|------------------------|----------------------|--------|
| Head and Neck Locations | 311 (66.9%) | 154 (33.1%) | 465 |
| Trunk Locations | 107 (75.9%) | 34 (24.1%) | 141 |
| Totals | 418 | 188 | 606 |

Source: Enumeration of signs from Stokoe et al. (1965), *Dictionary of ASL*.

$\chi^2 = 4.10$, d.f. = 1, p < .05

distinct. Areas higher in the signing space permit more complex combinations of manual visual elements, both in terms of fineness of location distinctions and the complexity of individual handshapes.

An explanation for both these restrictions based on visual perception was proposed by Siple (1973), who suggested that in areas of high visual acuity, finer differentiation of handshapes and locations was to be expected. Signers in a conversation do not look at each other's hands, since the hands move radically and rapidly; instead we observe that they seem to fix their gaze on the lower part of the signer's face (regardless of whether the signer is accompanying the signs by mouthed or spoken words).

Thus Siple hypothesized that visual acuity should be highest in this area (the small circle in Figure 12), and should fall off rapidly as the distance from this central area increases. Siple also proposed that in the areas in the outer reaches of sign space, in areas of low visual acuity, not only should there be signs with simpler handshapes (i.e., more unmarked handshapes), but also more two-handed signs. Every two-handed sign that contacts the body is highly symmetrical (according to the criteria already discussed under the Symmetry Condition), and thus a greater proportion of two-handed signs insures a greater amount of articulatory and perceptual redundancy for the signs made in this area. Note also the finer differentiation

of vertical locations in the combined head and neck area is also consistent with her explanation.

An alternative explanation to these findings is one based on visual "landmarks" rather than visual acuity. Coincidentally, the area delimited by Siple as corresponding to the highest visual acuity is also the area which has the greatest number of visually distinguishable (and readily nameable) body parts. On the visual backdrop of the facial surface we can readily distinguish the lips, chin, teeth, mouth, nose, nostril, cheek, jaw, dimple, moustache, temple,



Figure 12. Central area of signing space.

eye, eyebrow, etc., while the lower part of the signing space offers relatively fewer visible landmarks—shoulder, chest, side, waist. These distinguishable backdrop cues may facilitate the perception of the location of the sign.

The question of the relative merits of these two alternative explanations is best left to experimental determination; it is possible that the two systems interact and support one another. The issue of one- vs. two-handed signs in relation to sign locations will come up again in Chapter 2 [see original text].

If we take a slightly different view of the body and consider the lateral, not the vertical, placement of signs, we find restrictions also. We can distinguish three types of contact laterally: *Ipsilateral*, in which the hand (whether left or right) touches the corresponding side of the body; *Contralateral*, in which the hand crosses the line of symmetry and contacts the opposite side of the body; *Central*, in which the hand contacts the midline of the body.

In general, we observe that no ipsilateral or central contact is restricted—most ipsilateral and midline areas (on the different levels specified previously in Figure 11) are utilized by some signs. Contralateral contact is somewhat more restricted. Compare the shaded areas on the bodies in Figures 13a and 13b.

The shaded areas indicate where a right hand is attested in making a bodily contact during the articulation of a sign (the corresponding areas for the left hand of a left-dominant signer would be depicted by holding the page to a mirror). If we consider *all* types of body-contact signs, then Figure 13a represents where these contacts may take place.

Figure 13b shows a reduced contact area where signs specified for only a single contact may be made. Note that the areas which are shaded in Figure 13a but unshaded in

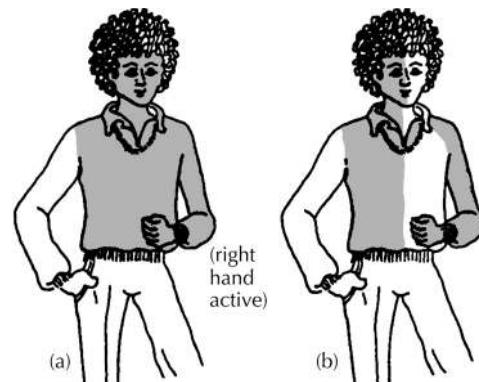


Figure 13. (a) Body locations for all signs.
(b) Body locations for single-contact signs.

Figure 13b are just those where a specific type of sign is made—signs which require two contacts, one on each side of the body's midline.

In the forehead area, there are signs such as SUMMER and BLACK, both of which brush a forefinger from contralateral to ipsilateral. At midface there is FLOWER, which contacts first the ipsilateral, and then the contralateral side of the nose. At the chin are the examples FARM, BACHELOR, RESTAURANT, SLOPPY, DRY and BORING, which contact the contralateral side and then move to contact the ipsilateral side of the chin. At the marginal area of the waist we have the sign SAILOR, in which both hands (in the O configuration) contact first the side contralateral to the dominant hand, then the ipsilateral side.

Regarding the shaded areas which are not common to both bodies in Figure 13, a morpheme structure condition is suggested: If a sign is specified for contralateral contact for a place other than the opposite breast or arm, then it is also specified for ipsilateral contact; *contralateral contact does not occur on its own*. But this constraint actually has very few signs in its domain; most of them are listed above. This fact, coupled with the

very restrictive nature of the constraint, suggests that ipsilateral locations are the more natural or unmarked, while contralateral locations are marked.

This seems in accordance with the intuitive notion that extra effort is required to move the manual articulator to a location on the opposite side of the body's midline. The exceptional nature of the opposite hand and arm as locations is likely due to the fact that they themselves are mobile and do assume a more central position when used as locations (e.g., as the passive hand in a type 2 or type 3 sign). The opposing hand, when used as a location where the moving hand articulates, is generally held in front of the central meridian of the body; it does not remain at the extreme edge of the body.

For locations of signs, we thus find that there are systematic restrictions on the use of certain locational elements, and some restrictions on combinations of these elements. This is true of both the vertical and lateral dimensions of location. We find some basis for these systematic restrictions in considering the dynamics of the moving articulator and principles of visual perception.

1.7 METRIC RESTRICTIONS

The last set of constraints to be proposed, before moving on to phonological processes in Chapter 2, involves specifying the temporal complexity of a sign by counting the number of manual articulations involved. Not surprisingly, there appears to be an upper limit, which shall be one of the principal concerns when we discuss the lexical restructuring of borrowed forms (loan signs) in Chapters 4 and 5 [see original text].

In fact, two is the upper limit of complexity for the formation of signs. A simple sign can be specified for no more than two different locations (a sign may require moving

from one location to another), and no more than two different handshapes (a sign may require that the handshape changes during the sign). It is not clear whether such an absolute metric restriction applies to either orientations or movements. Note that these restrictions are claimed for simple signs only, not compound signs. However, it is interesting to note that many, if not most, compounds are themselves composed of no more than two simple signs.

1.7.1 Locations

We have already discussed some restrictions on signs with double locations; now we can look at the range and variety of the occurrence of these signs. No sign is specified for more than two locations, which themselves must be located in the same major area. Figure 14 demarcates four major areas on the body where signs make contact. Any sign which makes two separate contacts with the body confines those contacts to the same major area. The only exceptions to this are

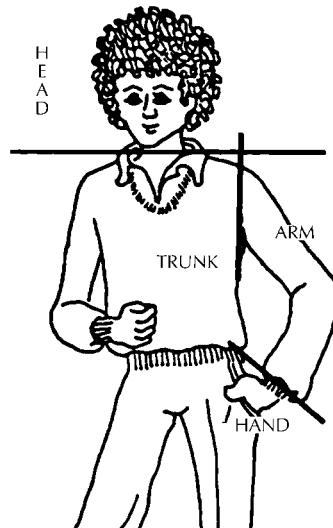


Figure 14. Four major areas.

compound signs or signs derived from compound signs.

Examples of signs made in two separate locations are (a) *Head area*—FLOWER (both sides of the nose), INDIAN (nose to crown or temple), BACHELOR (chin, contralateral to ipsilateral); (b) *Trunk area*—KING (contralateral breast to ipsilateral waist), SAILOR (both hips), OUR (breast, ipsilateral to contralateral); (c) *Arm area*—BRIDGE (wrist to elbow), IMPROVE (wrist to forearm), POWER (shoulder to forearm); (d) *Hand area*—TOAST (i.e., toasted bread; volar and dorsal surface), FLATTER (volar and dorsal surface of extended index finger), THEN (thumb tip to index tip).

In contrast to this restriction on simple signs, compound signs (or signs derived from compounds) may move from a location in one major area to a location in another major area: SISTER, derived from GIRL + SAME, contacts the cheek and then the opposite hand; REMEMBER, derived from THINK + SEAL, may contact the forehead before contacting the opposite hand; DAUGHTER, derived from GIRL + BABY, contacts the cheek and then the forearm. An examination of phonological processes in the following chapter will show that these complex compounds crossing major area boundaries are unstable, and tend to delete one of their locations.

1.72 Handshapes

Some signs may require that one or both hands change handshapes while making a sign; these signs are limited to no more than two such different handshapes. These signs which change handshapes during the articulation of a sign will be referred to as *double-handshape* signs, and are of great importance to understanding the restructurings of Chapter 4. Double-handshape signs fall into two broad types—those which

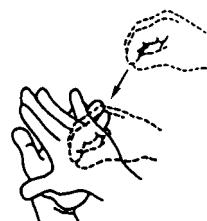


Figure 15. NOTE-DOWN

also involve moving from one location to another, and those which remain in one relatively confined area. Both of these types include signs made in space and signs made on the body. Examples of each of these follow.

NOTE-DOWN (Figure 15) is made on the opposite palm, and involves changing the active hand from an O to a 5, without any additional movement. (This sign means “to make a note of something important,” not “taking notes in a class.”) Other double-handshape signs made in one location on the body include ACCEPT (5 becomes O, contacting the trunk), ORANGE (C closes to S, in front of the mouth or chin), CHEWING-GUM (V becomes V̄ [Bent V], fingertips contacting cheek).

Double-handshape signs which move on the body include RESTRAIN-FEELINGS (Figure 16) (5 becomes S, moving down the trunk), SPLIT/DISAPPEAR (L becomes bO [baby O], moving along the extended index of the opposite hand), FAR-OUT (5 becomes S, with the same location and movement as SPLIT).

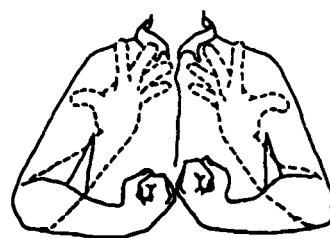


Figure 16. RESTRAIN-FEELINGS

Double-handshape signs made in space, off the body, may also be either static or moving, although locational points are not as easy to supply, since there are no convenient reference points in space without reference to the body. Static double-handshape signs made in space include MILK (hand held about shoulder height, C becomes S, repeatedly), and one of the signs for BEAT/OVERCOME (S becomes H). Other signs which might fit this class include 81 of the signs for the numbers between ELEVEN and NINETY-EIGHT. However, these are all transparently analyzable as compounds.

Finally, signs which move in space and also change handshapes: SIGN-ASL (verb; Figure 17) (each hand alternatively moves forward, changing from S to 5, repeatedly); WELFARE/SUBSCRIBE (hand moves from head height to shoulder height, changing from L to bO (baby O)); BE-PREPARED (Figure 18) (ulnar surface of one S-hand contacts thumb surface of the other S-hand, hands thrust forward and change to 5-hands, once); BAWL-OUT (same as BE-PREPARED, but rapidly reduplicated).

Double-handshape signs, in spite of their apparent complexity, appear to be a stable part of the language if we judge on the basis of their prominence—there are 155 double-handshape signs listed in DASL. They exhibit a number of interesting characteristics which bear on the present discussion and

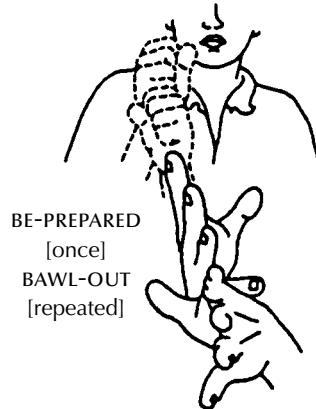


Figure 18.

on the later discussion of loan signs. There are four major points to be made about the *type* of handshapes which occur in double-handshape signs:

(1) As already pointed out, the handshapes which predominate in these signs are the unmarked seven—A, S, 5, B, G, C, and O. Of the 155 signs which change handshapes, 136, or 87.7%, involve at least one member of this select set; in 98 of the signs, or 63.2%, both handshapes are unmarked.

(2) The dimension of change which is most often involved in these handshape changes is that of relative *openness* and *closeness* of the handshapes. Thus straight, extended fingers may bend or fully contract into the palm ($B \rightarrow \dot{B}$, $V \rightarrow \dot{V}$, $5 \rightarrow S$); extended fingers which are bent or curved may straighten out ($\dot{B} \rightarrow B$, $\dot{V} \rightarrow V$, $O \rightarrow 5$, $X \rightarrow G$) or they may close ($C \rightarrow S$); fingers which are contracted into a compact fist may extend fully ($A \rightarrow 5$, $S \rightarrow 5$). 153 signs, or 98.7%, vary in this way along the closed/open dimension. (The two exceptions are HAIRCUT and BOTH, in which $V \rightarrow U$; the fingers converge but do not close or bend.)

(3) It follows from the above that most of these handshapes involve *maximal* changes

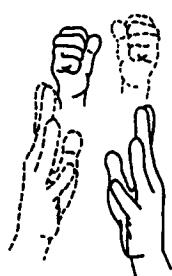


Figure 17. SIGN-ASL (repeated)

along the closed/open dimension. If we consider the two handshapes A and S to be the maximally compact, closed handshapes, and B and 5 as the maximally open handshapes, then these two end-points enjoy a prominent role in double-handshape signs. 125 signs, or 80.6%, involve at least one element from the set A, S, B, and 5 (83 as the initial handshape, 73 as the final handshape, and 31 signs which involve a maximal change from A/S to B/5, or vice-versa).

(4) The handshape changes on the dimension of open/closed are generally relevant to all involved fingers. Thus, if two fingers are extended, both will be bent; if five fingers are extended, all of them will be bent over or closed completely, etc. In measuring this tendency, we find that 136 signs, or 87.7% of the double-handshape signs, change the closed/open dimension of all involved fingers, instead of merely some of them. So while there are signs where C → S (closing all fingers), we do not find C → ũ (leaving two bent extended fingers); we find O opening all its fingers to 5 and closing all its fingers to S, but we do not find signs where an O opens two of its fingers to an L, nor do we find signs where O closes three of its fingers to bO (baby O).

Double-handshape signs exhibit restricting tendencies on handshapes which exclude many logically possible, but overly complex gestures. Complexity of these signs is held to a minimum by favoring the involvement of unmarked handshapes which make simple transitions to other unmarked handshapes along a single dimension of *open* vs. *closed* hand.

1.73 Iterations

Besides measuring the number of locations and number of handshapes included in a sign, we can also measure the number of unit *executions* or beats that are required to

articulate a sign. Execution here means the production of the basic specified units of the sign—its location, handshapes, orientation, and movements all in one bundle (some of these locations or handshapes may be doubled or complex, as we have just seen). Thus a single execution or beat is one complete cycle of a sign, with no part of it being repeated.

Some signs require internal repetition; the individual lexical item may consist of a reduplicated gesture. Sometimes this serves to mark an inflection on a sign which commonly consists of one execution. Some noun plurals are formed this way, for example, and some verb inflections are marked by special types of repetition (Fischer 1973). But what concerns us here are the parameters of monomorphemic lexical description and differentiation. In this regard, it turns out that some signs simply require two beats, some for seemingly arbitrary reasons, and some because they are derived from signs which once had two different locations, but currently have a reiterated gesture made in one location (Frishberg 1975, 1976).

Examples of signs that require two metrical beats include MANY (which itself is a double-handshape sign in which S→5, so the sign consists of a chain of handshapes; S→5→S→5), SCHOOL, KNOCK (on a door), GO-BACK-AND-FORTH (or COMMUTE), BAWL-OUT (Figure 18), DISCUSS (Figure 4), PAIN, PREACH (Figure 4), and NAME (Figure 3).

There are also some signs which always have only a single beat, the movements of these often being sharp. Reduplication in these forms is either not attested, or only found when the sign is inflected in some other manner. These include the signs: BE-PREPARED (Figure 18), TRICK (“to trick someone;” volar side of active A hand hits dorsal side of upright passive G, once); ILLEGAL (volar knuckles of active L strikes

and rebounds from volar surface of passive B, once); LOSE (“to lose a game;” volar folded knuckles of active V contacts volar surface of passive B, once); CONVINCE (ulnar edge of B strikes edge of upright G, once); KNACK/CAN-DO (tips of thumb and index of F contact chin, once; see DASL pp. 155–156).

Further, we should note two things. First, while there are signs which are limited to one beat in unmarked contexts, the signs which require at least two beats have no absolute limit on the actual number of iterations. The number two is a required minimum; such a sign may be produced with three iterations, or four iterations, etc. There are no lexical distinctions based on the difference between two and four iterations, or two and five iterations, etc.; the difference is between signs with one beat and those with iterations.

1.8 SUMMARY

We have seen that for the submorphemic level of American Sign Language, the formalizational level, one can establish goals of description and explanation which are consonant with those of generative phonology. In particular, the phonological component of a language must determine the permissible and inadmissible forms of a language. Starting with a brief description of the manual visual elements of ASL, the primes which fall into the four aspects of location (tab), handshape (dez), movement (sig), and orientation, we have seen that ASL restricts the formation of admissible signs:

(1) The units themselves have a hierarchy of complexity which is measurable. Certain handshapes (A, S, B, 5, C, G, and O) are unmarked handshapes. Certain locations of the body are favored over others for the complexity of signs they enter into: Ipsilateral and central locations are

unmarked in this regard, and contralateral locations are marked; locations in proximity to the head area allow finer differentiation of handshapes and locations than in the trunk area, and this is in accordance with strategies for visual perception available to the sign perceiver.

(2) Other constraints regulate the combinational properties of these elements as they form morphemes. The Symmetry Condition requires symmetry if both hands of a sign are moving, in order to limit the complexity of the sign; likewise, the Dominance Condition restricts the movements and possible handshapes of the passive hand in signs which have two different handshapes, one on either hand. Bilateral symmetry is thus unmarked, and asymmetry is marked.

(3) For double-handshape signs (signs which change handshapes during the sign), signs which have two locations, and signs which have a double execution (or reduplication), we also find restrictions. We have posited an upper limit on the underlying form of a sign, which states that it may not require more than two handshapes, two locations, or two separate executions of the basic gestural motor act. Double-handshape signs themselves are restricted in the types of handshapes which they may involve.

There remains another very important question: Do these proposed constraints systematically disallow certain manual formations in ASL, or do they merely represent accidental gaps in the lexicon which could be filled but are not? A tentative answer will be proposed after more evidence is presented in Chapter 2.

In conclusion, these are the basic points:

- a. It is possible to describe and measure formalizational complexity of signs.
- b. There are severe restrictions on the

formation of signs which exclude the more complex combinations of manual-visual components.

- c. Therefore not all possible manual-visual gestures are permissible signs in ASL.
- d. The restrictions on possible occurring signs of ASL are motivated by the dynamics inherent in manual articulation and visual perception: The restrictions are linguistic limitations on information coding, partly brought about by a need for systematic redundancy in the signals.

In informal terms, Chapter 1 has pointed out “what signs look like, and why.” In Chapter 2 we shall see how these principles and structures take a more active role in determining the shape and substance of American Sign Language—in other words, how signs behave, both in terms of passage of time, and in terms of juxtaposition to other signs.

NOTES

1. Sign glosses are given in small capital letters. The gloss is simply a common translation of the sign into an English word, and the semantic, syntactic, and morphological properties of the word and the corresponding sign do not necessarily coincide. For example, the English word “attend” has two different ASL translations, one sign meaning “pay attention,” and the other meaning “to go to an event.” Conversely, the single ASL sign SINCE can also be translated into English as “lately,” “up till now,” “has been,” etc. As such, *the capitalized gloss is merely a convenient label or name of a sign*. As much as possible, the same capitalized gloss (name) will always be applied to the same sign. Additional notes on other transcription conventions will be found in Chapter 4.
2. The capital letters and numerals used in descriptions of signs are names (or symbols) of handshapes, and should not be confused with letters of any alphabet (although in some cases that is the motivation for the symbol). The symbols in this study are based on Stokoe’s (1960) transcriptional system.
- The reader who is unfamiliar with the handshapes involved in fingerspelling and in American Sign Language should consult Appendix A; Stokoe’s symbols for handshapes appear in Appendix B [see original text].
3. This concurs with Kimura’s findings (1973a, b) that the dominant hand makes more free movements while accompanying speaking activity. From these studies and many more, including cases of aphasia in deaf signers, she makes a strong case for left hemispheric control (in right handers) of the motor activities underlying verbal and gestural activity, including sign language (Kimura 1974, Kimura, Battison, and Lubert 1976).
4. For the purpose of simplifying the discussion here, this “select set of seven handshapes” includes phonetically distinct variants which do not always contrast at any underlying level of representation. A permissible variant of A on the passive hand (and certain other contexts) is S, which differs only in that the thumb is more compact—placed over the knuckles rather than at the side of the index finger—the A is generally found in signs requiring volar contact and the S hand with ulnar contact. B (with thumb held at side of index finger—not folded into palm as with fingerspelled B) and 5 also co-vary or freely vary in many contexts. See Friedman (1976) for a more detailed description of the distributional patterns of handshapes.
5. “Initialized” signs (or “initial dez” signs, or “initial handshape” signs) are those whose handshapes correspond (via fingerspelling) to the first letter of the English word which commonly translates the sign. Thus the sign WAY may use a W handshape, although it is standardly made with a B handshape. More commonly, many signs use one of the handshapes that do not correspond to a letter of the fingerspelled alphabet (e.g. AIRPLANE, HATE, and THIRD); recall that there are more than 26 different handshapes. Other signs coincidentally use handshapes which correspond to fingerspelled letters, but they may have no connection to an English gloss (e.g. SCHOOL with B handshapes, TELEPHONE with a Y handshape, SIGN(ATURE) with a B and an H hand). For some handshapes (e.g. D, E, R, T, and W), nearly all the signs which employ them are initialized signs. In this sense they can be said to occur in a restricted context, since they are not freely productive handshapes. For example, signs commonly made with an R handshape include RESTAURANT, ROCKET, ROOM, RAT, RATHSKELLAR, RED, REGISTER, RESEARCH, RULE, REASON, RESPOND, and REHEARSE.

File 1.1: Why Study Language?

Language makes us uniquely human. While some species have the capacity to communicate using sounds and gestures, and some others can even acquire certain aspects of human language, no other species are comparable to humans with respect to the creativity and complexity of the systems that humans use to express thoughts and to communicate. We can manipulate elements in our language to create complex thoughts and we can understand words and sentences that we have never spoken or heard. This capacity is shared by hearing people and deaf people, and it emerges very early in the development of children, who acquire adult linguistic competence in an astonishingly short period of time. It is the human language faculty that makes this possible. Used as a probe into the human mind, language provides us with a unique window through which we can investigate a fundamental aspect of what it is to be human.

Language also reflects one's self-identity and is indispensable for social interactions in a society. We perform different roles at different times in different situations in society. Consciously or subconsciously, we speak differently depending on where we come from, who we talk to, where the conversation is carried out, what purposes we have, etc. For example, southerners in America tend to speak in an accent different from, say, that of native New Yorkers; a conversation between

two buddies would not be the same as a conversation between a clerk and his/her boss; two lawyers talking in a café would be different from when they talk in the courtroom; to sound younger, a middle-aged person, being aware of a linguistic change in progress, might imitate "up-talk" (ending a declarative sentence with a rising pitch), which has become prevalent among the younger generation, etc. All languages are variable, and they reflect our individual identity, as well as social and cultural aspects of a society.

Language at the application level can make a difference to people's everyday life. The use of computers today is a good example. We know that computers don't learn human language by themselves; it is humans who build into the computers details of the structure and other aspects of human language so that they are able to interact with us, let us retrieve information, recognize our voice, talk to us, translate from one language to another for us, and so on. This technology would not have been available if not for the study of language. And, despite many achievements thus far, it's still a long journey before computers become able to use language like humans do.

Human language is an enormously complex phenomenon. The task of a linguist is to study how humans acquire language and to tease out the patterns and the possible interactions of different aspects of human

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language, despite the apparent complexity. The study of language will not disappoint the challenge-seekers, the scientific discoverers, or simply the curious.

This introductory chapter will lay out the objectives of this introductory course on language and linguistics (File 1.2), highlight

for you the use of speech data and the descriptive approach that linguists use for linguistic investigation (File 1.3), and bring to your awareness the important assumption that the relationship between form and meaning of linguistics signs is basically arbitrary (File 1.4).

File 1.2: Course Objectives

1.2.1 A PRE-COURSE SURVEY

Please take a look at the following list. Do the statements sound familiar to you? Do you share similar views about language?

1. People who say *Nobody ain't done nothin'* can't think logically.
2. Swearing degrades a language.
3. Kids need to study for years in school to learn to speak their language properly.
4. Many animals have languages much like human languages.
5. Writing is more perfect than speech.
6. The more time parents spend teaching their children English, the better their children will speak.
7. You can almost always recognize Jews and Blacks by the way they talk.
8. Sloppy speech should be avoided whenever possible.
9. *It's me* is ungrammatical, bad English, and ought to be avoided by educated speakers of English.
10. The English language traces its ancestry back to Latin.
11. Women generally speak better than men.
12. There are "primitive" languages with only a few hundred words.
13. French is a clearer and more logical language than English or German.
14. People from the East Coast talk nasally.
15. Homosexuals lisp.
16. Some people can pick up a language in a couple of weeks.

17. It's easier to learn Chinese if your ancestry is Chinese.
18. Native Americans all speak dialects of the same language.
19. The only reasonable way to arrange words in a sentence is to start with the subject and follow with the verb.
20. English is a simpler language than Latin or Greek.
21. Every language distinguishes singular nouns from plural nouns by adding an ending in the plural.
22. The only ways deaf people can communicate are by writing, by reading lips, and by spelling out English with their fingers.
23. People all over the world indicate "yes" or "no" by the same set of head gestures.
24. Correct spelling preserves a language.
25. International relations would improve if everyone spoke the same language.
26. Japanese, Chinese, and Korean are dialects of the same language.
27. There were once tribes of Native Americans that had no spoken language but relied solely on sign language.
28. Eskimos don't have a general word for 'snow', therefore they can't think abstractly.
29. The more words you know in a language, the better you know the language.
30. Nouns refer to people, places, or things only.

People have all sorts of beliefs about language, only some of which have been supported by the research of linguists (linguists

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are people who do scientific research of languages). One of the incidental objectives of this course is to correct misconceptions about particular languages and about language in general. Some of these misconceptions are harmless, while others are not; some of these beliefs could lead a person to spend a great deal of time trying to change things that can't be changed or don't need to be "fixed," and some can even be used as instruments of prejudice against various groups. The above is a list of misconceptions that some people have expressed concerning language and language use. Some of the items you will readily perceive as misconceptions and will be able to explain why they're misconceptions. Others you may recognize as misconceptions without really being able to explain why. And still others you may even agree with. You may wish to refer to this list as the course progresses. At the end of this course, we hope you'll be able to look at this list and provide an explanation of why the above are *all* misconceptions.

1.2.2 GENERAL CONCEPTUAL GOALS

Below is a list of some very general principles of human language that will be explained and illustrated throughout this course. Though the full significance of these characteristics won't be apparent to you at the beginning of the course, they are the underlying themes of many of the lectures you will hear and the assignments you will read.

1. Every language is enormously complex.
2. Despite this enormous complexity, every language is systematic, often in ways that are hidden (i.e., not obvious to the language users) and surprising. (General statements of the systematic relationships in a language are called **rules**.)
3. Not only is language systematic, but it is systematic on many levels, from the

system of sounds to the organization of discourses.

4. This systematicity is sometimes hard to see, for at least two reasons:
 - a. the very complexity of language obscures the patterns and regularities; and
 - b. in actual speech, there are hesitations, errors, changes in midstream, interruptions, confusions, and misunderstandings.
5. Language varies systematically from person to person, area to area, situation to situation. There is **variation** at every level of structure. Speakers are not consciously aware of most of this variation.
6. Languages are diverse, often astonishingly so. There are surprising differences in the way individual languages are organized.
7. Despite this diversity, there are a great many **universal** properties of languages; that is, there are characteristics shared by all languages as well as characteristics no language can have.
8. Some properties of a language are **arbitrary**, in the sense that they cannot be predicted from other properties or from general principles.
9. It is not easy for speakers of a language to reflect on their speech; although a great many complex rules govern our speech, we are no more aware of them than we are of the principles that govern ball throwing or bicycle riding.
10. The **attitudes** that people hold about their language and other languages, or about their own speech and other people's, can be very different from the **facts** about them. These attitudes are often based on nonlinguistic factors and make an important field of study on their own.
11. **Speech** is the primary manifestation of language, and **writing** is only a secondary one.
12. Although children learn their first language, they cannot really be said to have

been taught it. They intuit the rules of their language from what they hear, guided by certain implicit assumptions about what language is like.

13. All languages **change** as time passes, whether speakers desire change or not; often speakers are not aware of changes in progress.
14. Linguists try to give accounts of the properties of a language that are both as precise and as complete as possible.
15. Linguists try to determine the ways in which all languages are alike and the ways in which they differ.

1.2.3 IMMEDIATE OBJECTIVES

We would like you to draw from this course a broad understanding of human language: what it is, what it's used for, and how it works. The purpose of this course is to enable you to recognize an uninformed statement about language when you hear it, but not to teach you to speak or write better. Five years after this course is over, after you may have forgotten all the definitions and phonetic symbols you will have learned in it, we hope the course will have left you with a sharper ear for language, a deeper understanding of its nature, and a livelier interest in all its manifestations.

The more immediate objectives of this course are:

1. To lead you to examine your own beliefs and attitudes about language and language use.
2. To make you aware of both the diversity of language systems and their fundamental similarities.
3. To give you a reasonable taste of what we can study about language — e.g., how are speech sounds produced (phonetics), how are they organized in English and in other languages (phonology), how are words formed (morphology), what is the meaning of “meaning” (semantics), how are words strung together to form sentences (syntax), what role does context play to help accurate parsing of sentences (pragmatics), how do languages change (historical linguistics), how is the human brain connected with the use of language, how do humans acquire language and how does the human mind process language (psycholinguistics), how is language used and how does it vary in society (sociolinguistics), and how do computers process language (language and computers).
4. To equip you with some tools and techniques for linguistic analysis and to give you some practice in using these to discover the organizing principles of a language.
5. To acquaint you with the basic concepts necessary to further pursue linguistic studies, if you wish to.

File 1.3: “Good” Language?

1.3.1 SPEECH AND WRITING

Speech and writing are two different forms of communication that serve different functions. Neither is more superior or inferior than the other. However, there is a widely held misconception that writing is more perfect than speech. To many people, writing somehow seems more correct and more stable, whereas speech can be careless, corrupted, and susceptible to change. Some people even go so far as to identify “language” with writing and to regard speech as a secondary form of language used imperfectly to approximate the ideals of the written language.

One of the basic assumptions of modern linguistics (as opposed to linguistics before the beginning of the twentieth century), however, is that speech is primary and writing is secondary. (Again, this shouldn’t be interpreted as a superiority ranking.) The most immediate manifestation of language is speech and not writing. Writing is in most cases the representation of speech in a physical medium different from sound. Spoken language encodes thought into a physically transmittable form, while writing, in turn, encodes spoken language into a physically preservable form.

Writing is a two-stage process. All units of writing, whether letters or characters, are based on units of speech, i.e., words, sounds,

or syllables. When linguists study language, they take the spoken language as their best source of data and their object of description (except in instances of languages like Latin for which there are no longer any speakers). We will be concerned with spoken language throughout this course. Though ideally we would prefer to give our examples in audio form, for technical reasons we will instead use the conventional written or orthographic form, with the understanding that it is always the spoken form that is intended.

There are several reasons for maintaining that speech is primary/basic and writing is secondary. The most important ones are the following:

1. Writing is a later historical development than spoken language. Current archeological evidence indicates that writing was first utilized in Sumer about 6,000 years ago. (What was once Sumer is in modern-day Iraq.) The Sumerians probably devised written characters for the purpose of maintaining inventories of livestock and merchandise. As far as physical and cultural anthropologists can tell, spoken language has probably been used by humans for hundreds of thousands of years.
2. Writing does not exist everywhere that spoken language exists. This seems hard to imagine in our highly literate society. But the fact is that there are still many communities in the world where a written form of language is not used. According to

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the latest information provided by SIL International, among the approximately 6,900 languages in the world today, a rough estimate of 3,900 languages (or 57%) are unwritten (*Ethnologue*, 2004 version forthcoming). Note that this estimate says nothing about literacy percentages or fluency, only about whether a writing system exists. Even in cultures that use a writing system there are individuals who fail to learn the written form of their language. In fact, the majority of the earth's inhabitants are illiterate, though quite capable of spoken communication. However, no society uses only a written language with no spoken form.

3. Writing must be taught, whereas spoken language is acquired automatically. All children (except children with serious learning disabilities) naturally learn to speak the language of the community in which they are brought up. They acquire the basics of their native language before they enter school, and even if they never attend school they become fully competent speakers. Writing systems vary in complexity, but regardless of their level of sophistication, they must all be taught.
4. Neurolinguistic evidence (studies of the brain "in action" during language use) demonstrates that the processing and production of written language is overlaid on the spoken language centers in the brain. Spoken language involves several distinct areas of the brain; writing uses these areas and others as well.

So what gives rise to the misconception that writing is more perfect than speech? There are several reasons:

1. The product of writing is usually more aptly worded and better organized, containing fewer errors, hesitations, and incomplete sentences than are found in speech. This "perfection of writing" can be explained by the fact that writing is the result of deliberation, correction, and revision while speech is the spontaneous

and simultaneous formulation of ideas; writing is therefore less subject to the constraint of time than speech is.

2. Writing is intimately associated with education and educated speech. Since the speech of the educated is more often than not set up as the "standard language," writing is associated indirectly with the varieties of language that people tend to view as "correct." (However, the association of writing with the standard variety is not a necessary one, as evidenced by the attempts of writers to transcribe faithfully the speech of their characters. Mark Twain's *Huckleberry Finn* and John Steinbeck's *Of Mice and Men* contain examples of this.)
3. Because spoken language is physically no more than sound waves through the air, it is ephemeral and transient, but writing tends to last, because of its physical medium (characters on some surface), and can be preserved for a very long time. Spelling does not seem to vary from individual to individual or from place to place as easily as pronunciation does. Thus writing has the appearance of being more stable. (However, spelling does vary as exemplified by the differences between the British and the American ways of spelling *gray* and words with the suffixes *-ize* and *-ization*. (The British spellings are *grey* and *-ise* and *-isation*.) Writing could also change if it were made to follow changes in speech. The fact that people at various times try to carry out spelling reforms amply illustrates this possibility. (For instance, *through* is sometimes spelled *thru* to reflect its modern pronunciation more closely.)

1.3.2 LINGUISTIC COMPETENCE AND LINGUISTIC PERFORMANCE

As a speaker of English, you know a great deal about your language, but suppose someone were to ask you to put all that knowledge down into a textbook to be used

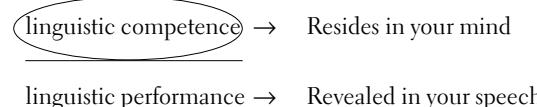
to teach English to others. You would soon find out that although you know perfectly well how to speak English, you are not consciously aware of most of that knowledge. Linguists are interested in this “hidden” knowledge, which they call linguistic **competence**. In this course we will be examining (among other things) the elements of linguistic competence — that is, what you know when you know a language.

But if linguistic competence isn’t available to conscious thought, how can we find out what this competence is like? We can observe speakers’ linguistic **performance** through their speech, make hypotheses and draw conclusions about the unconscious knowledge (linguistic **competence**) that underlies it. This is analogous to when you see nurses, doctors, people on wheelchairs, ambulances, etc., come out of a building unknown to you in a foreign country, you might hypothesize that the internal structure of the building unseen to you is a hospital. You can also think of linguistic competence as being a person’s unseen *potential* to speak a language, and his or her linguistic performance as the observable *realization* of that potential. Compare it with riding a bicycle. You can have the ability to ride a bike even when you’re not using that ability and even though you probably aren’t fully aware of all the complex motor tasks and feats of balance and timing that are involved. (As with your knowledge of language, there are many things about riding a bicycle that you cannot fully explain to someone else.) When you get on a bike and go, that’s bicycling performance.

Now suppose you’re riding along, and you hit a bump and fall off. That doesn’t mean you’re not a competent cyclist, even though your performance was impaired. Maybe you just weren’t paying attention to where you were going, or a squirrel ran in front of your tire, or it was dark and you couldn’t see well. Linguistic performance is

quite similar: speech usually contains lots of mistakes and hesitations, but that doesn’t mean that the competence underlying that speech is flawed. Since competence can’t be observed directly, linguists use linguistic performance as a basis for making hypotheses and drawing conclusions about what competence must be like. However, in most cases they try to disregard performance factors (the inevitable speech errors, incomplete utterances, and so on) and focus on consistent patterns in their study of linguistic competence. (1) below helps you visualize the relationship between linguistic competence and linguistic performance.

(1) Visualizing the relationship



1.3.3 PRESCRIPTIVE VS. DESCRIPTIVE RULES OF GRAMMAR

- (2)
 - i. Never end a sentence with a preposition.
NO: Where do you come *from*?
YES: *From* where do you come?
 - ii. Never split an infinitive.
NO: . . . *to boldly go* where no one has gone before
YES: . . . *to go boldly* where no one has gone before
 - iii. Never use double negatives.
NO: I *don't* have *nothing*.
YES: I *don't* have *anything*. I have *nothing*.

To most people, the word **grammar** means the sort of thing they learned in English class or in other language classes, when they were taught about subjects and predicates and parts of speech, and told not to dangle participles or strand prepositions, etc. (2) above shows some examples of this sort of grammar. To a linguist, however, “grammar” means something rather different: it is the

set of elements and rules that make up a language. Actually, linguists recognize three distinct things called "grammar": (a) mental, or *competence*, grammar, (b) the linguist's description of the rules of a language, the *descriptive* grammar, and (c) the socially embedded notion of the "correct" or "proper" ways to use a language, the so-called *prescriptive* grammar.

a. Mental grammar. The *mental* grammar consists of those aspects of a speaker's knowledge of language that allow him or her to produce grammatical utterances—that is, a speaker's linguistic *competence*. This kind of grammar is made up of knowledge of phonetics, phonology, morphology, syntax, and semantics. Everyone who speaks a language has a grammar of that language in his or her head, but details of this grammar will vary among dialect groups and even among speakers of the same dialect. Note that this idea of grammar has to do with whether particular sentences or utterances are acceptable in general with respect to their structure, but this does not directly determine their appropriateness in particular situations. You can imagine producing perfectly grammatical sentences that are pragmatically unacceptable or stylistically odd—for example, answering a question with a wholly irrelevant statement or using lots of slang on a graduate school application. Knowledge of pragmatics and style, and language variation, is not usually considered to be part of grammar proper, though it is an important part of your knowledge about language.

b. Descriptive grammar. Linguists concern themselves with discovering what speakers know about a language and describing that knowledge objectively. They devise rules of *descriptive* grammar. For instance, a linguist describing English might

formulate rules (i.e., descriptive generalizations) such as these:

- (3) 1. Some English speakers end a sentence with a preposition.
2. Some English speakers split an infinitive.
3. Some English speakers use double negatives for negation.
4. Adjectives precede the nouns they modify.
5. To form the plural of a noun, add -s.
6. The vowel sound in the word *suit* is produced with rounded lips.

Descriptive grammar, then, is created by linguists as a model of speakers' linguistic competence.

c. Prescriptive grammar. When most people think of "grammatical rules," they think of what linguists call rules of *prescriptive* grammar. Prescriptive rules tell you how to speak or write, according to someone's idea of what is "good" or "bad." Of course, there is nothing inherently good or bad about any use of language; prescriptive rules serve only to mold your spoken and written English to some norm. (1) above provides a few examples of prescriptive rules; you can probably think of others.

Notice that the prescriptive rules make a value judgment about the correctness of an utterance and try to enforce a usage that conforms with one formal norm. Descriptive rules, on the other hand, accept the patterns a speaker actually uses and try to account for them. Descriptive rules allow for different varieties of a language; they don't ignore a construction simply because some prescriptive grammarian doesn't like it.

So, if prescriptive rules are not based on actual use, how did they arise? Many of these rules were actually invented by someone. During the seventeenth and eighteenth centuries, scholars became preoccupied with the art, ideas, and language of ancient Greece and Rome. The classical period was regarded as a golden age and

Latin as the perfect language. The notion that Latin was somehow better or purer than contemporary languages was strengthened by the fact that Latin was by then strictly a written language and had long ceased to undergo the changes natural to spoken language. John Dryden's preoccupation with Latin led him to write: "I am often put to a stand in considering whether what I write be the idiom of the tongue . . . and have no other way to clear my doubts but by translating my English into Latin." For many writers of the seventeenth and eighteenth centuries the rules of Latin became, whenever remotely feasible, the rules of English. The rules in (2) above are all results of this phenomenon.

Speakers of English have been freely ending sentences with prepositions since the beginning of the Middle English period (about 1100). There are even some instances of this construction in Old English. Speakers who attempt to avoid this often sound stilted and stuffy. The fact that ending sentences with prepositions is perfectly natural in English did not stop John Dryden from forbidding it because he found it to be non-Latin. His rule has been with us ever since (see (2), i).

Since the early Middle English period, English has had a two-word infinitive composed of *to* plus an uninflected verb (e.g., *to win*). English speakers have always been able to split this two-word infinitive by inserting words (usually adverbs) between *to* and the verb (e.g., *to quickly hide*). There have been periods in English literary history when splitting infinitives was very fashionable. However, eighteenth-century grammarians noticed that Latin infinitives were never split. Of course, it was impossible to split a Latin infinitive because it was a single word (e.g., *describere* 'to write down'). But that fact did not prevent the early grammar-

ians from formulating another prescriptive rule of English grammar (see (2), ii).

The double negative rule (see (2), iii) has a different source. In Old and Middle English (usually for the purposes of emphasis) double and triple negatives were common, and even quadruple negatives existed. The sentence in (4) from Old English illustrates this. It contains two negative words and was entirely grammatical.

| | | | | | |
|-----|-----------|-------|-----------|---------|------|
| (4) | ne | bið | ðær | nænig | ealo |
| | not | is | there | not-any | ale |
| | gebrownen | mid | Estum | | |
| | brewed | among | Estonians | | |

'No ale is brewed among the Estonians'.

By Shakespeare's time, however, the double negative was rarely used by educated speakers, although it was still common in many dialects. In 1762, Bishop Robert Lowth attempted to argue against the double negative by invoking rules of logic: "Two negatives in English destroy one another or are equivalent to an affirmative." Of course, language and formal logic are different systems, and there are many languages (e.g., Russian and Spanish) in which multiple negation is required in some cases for grammaticality. Certainly no one misunderstands the English-speaking child or adult who says, "I don't want none." But Lowth ignored the fact that it is *usage*, not logic, that must determine the descriptive rules of a grammar.

It is somewhat surprising that rules that do not reflect actual language use should survive. There are several reasons, however, for the continued existence of prescriptive rules. First, they provide a standard form of a language that is accepted by most speakers of that language; adherence to prescriptive rules allows a speaker to be understood by the greatest possible number of individuals. This

is especially important for a language such as German, which has dialects so different from one another that their speakers cannot always understand each other. Second, a set of standard rules is necessary for students learning English (or any other language) as a second language. Imagine the chaos if there were no guidelines for learning English (or Spanish, or German, or Russian, etc.). Thus they serve a very useful purpose for language teachers and learners as well. Finally, and most importantly, there are social reasons for their existence. Nonstandard dialects are still frowned upon by many groups and can inhibit one's progress in society. The existence of prescriptive rules allows a speaker of a non-standard dialect to learn the rules of the standard dialect and employ them in appropriate social circumstances (cf. File 10.3). Therefore, prescriptive rules are used as an aid in

social mobility. This does not mean, however, that these judgments about dialects are linguistically valid. The idea that one dialect of a language is intrinsically better than another is simply false; from a strictly linguistic point of view all dialects are equally good and equally valid. To look down on nonstandard dialects is to exercise a form of social and linguistic prejudice.

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File 1.4: Arbitrariness in Language

Let's consider this scenario. Suppose you travel on a new device that you have just invented without any of your friends knowing about your invention. Imagine that it is a bubble-like thing that can take you to wherever you want, but it doesn't use roads; it flies! You find it too clumsy to use such a long description to explain to other people how you get around, so you decide that you're going to give this product a brand new one-word name in English. Let's say you're going to call it a *glarf*. (In fact, you might as well call it *blick*, *twipsy*, *krap*, *leslie*, etc., etc. The device that you have invented does not require that it must be named in a particular way.)

Now comes the time to show off. This is the first time that you are going to tell your friends that you travel using your *glarf*. Do you think your friends would have any idea what a *glarf* is simply by hearing the *sound* of the word? Probably not, unless you tell them when you use this word for the first time what its *meaning* is. In fact, the meaning of a simple word (one not formed of other words) is usually completely unpredictable.

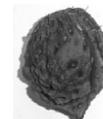
1.4.1 THE MAKE-UP OF A LINGUISTIC SIGN

It is generally recognized that the words of a language represent a connection between a group of sounds, which give the word or word piece its *form*, and a meaning, which the sound can be said to represent. The

combination of a form and a meaning connected in this way gives what may be called a **linguistic sign**.

- (1) Form + Meaning = Linguistic Sign

For example, one word for the inner core of a peach is represented in English by the sounds [pit]¹ (we spell as *pit*), occurring in that order to give the sound (i.e., the form) *pit*.



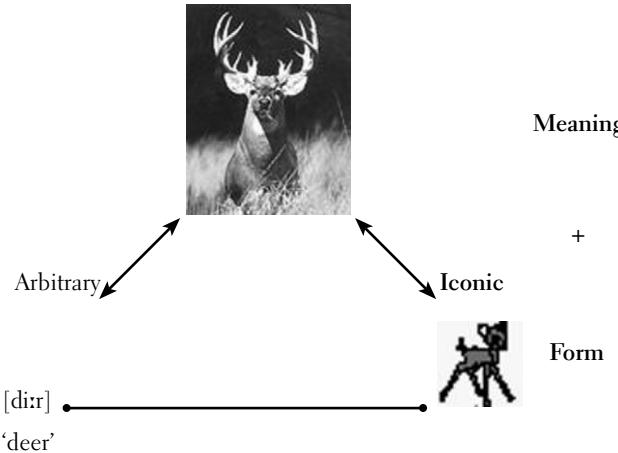
- (2) [pit] +  = the word *pit*

1.4.2 ARBITRARY CONNECTION BETWEEN FORM AND MEANING OF LINGUISTIC SIGNS

An important fact about linguistic signs is that, typically in language, the connection between form and meaning is **arbitrary**. The term 'arbitrary' here refers to the fact that the meaning is not in any way predictable from the form, nor is the form dictated by the meaning. The opposite of arbitrariness in this sense is **nonarbitrariness**, and the most extreme examples of nonarbitrary form-meaning connections are said to be

1. Symbols in the square brackets “[]” are International Phonetic Alphabet (or IPA) symbols, a standardized set of symbols devised to indicate pronunciations for all languages. For more details, see Chapter 3 (Phonetics) and Appendix B (IPA Chart) [in original text].

(3) Form-meaning connection



iconic (or “picture-like”). Iconic forms represent their meanings directly. For linguistic signs in general, however, the connection between form and meaning is not a matter of logic or reason, nor is it derivable from laws of nature.

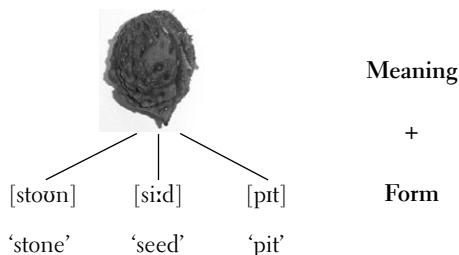
The fact that the inner core of a peach may be called a *stone* or even a *seed* as well as a *pit* points to arbitrariness, for if the connection between the form and the meaning here were nonarbitrary (because the form determined the meaning, or vice versa), there should only be one possible form to express this meaning. (This fact can also be seen in the scenario we considered in the beginning of this file: the new product can be given different names, and nobody would be able to figure out exactly what a given name refers to by simply hearing the name.) Also,

there is nothing intrinsic in the combination of the sounds represented by [pit] that suggests the meaning ‘inner core of a peach’; the same sequence of sounds can represent ‘a large, deep hollow in the ground’. (In the scenario given in the beginning of this file the sequence of sounds [lesli] (for *leslie*) could be a name of a person, and it could also be the name of the new product.)

Arbitrariness in language is shown in cross-linguistic comparisons. For instance, words with the same meaning usually have different forms in different languages, and similar forms usually express different meanings. See (5) for some examples.

If there were an inherent, nonarbitrary connection between forms and meanings, with the meaning being determined by the form, then such cross-linguistic differences

(4) On the arbitrary side of form-meaning connection



- (5) Arbitrary form-meaning connections of linguistic signs as seen cross-linguistically

| Forms | Meaning | Languages |
|---------|---|-----------|
| [watɹ̩] | 'water' | English |
| [o] | | French |
| [vase] | | German |
| [səy] | | Cantonese |
| [li] | e.g., a proper name 'bed' 'borrowed/lent' 'this' | English |
| | | French |
| | | German |
| | | Cantonese |

should not occur. There would be one universally correct form for each meaning, and every language would have no alternative but to connect that form and that meaning. You can see that if you were to follow this idea to its logical completion, there would now be only one universal and unified language, with no controversy over what a spoken word meant or how to express a certain meaning. It would all be automatic.

1.4.3 NONARBITRARY CONNECTION BETWEEN FORM AND MEANING OF LINGUISTIC SIGNS

It is clear that arbitrariness is the norm in language, at least as far as the basic relationship between the form of a word and its meaning is concerned. At the same time, though, it turns out that there are some nonarbitrary aspects to language.

a. Onomatopoeia. In the vocabulary of all languages a small degree of nonarbitrariness involves items whose forms are largely determined by their meanings. Most notable and

obvious are the so-called **onomatopoetic** (or **onomatopoeic**) words, i.e., words that are imitative of natural sounds or have meanings that are associated with such sounds of nature.

Examples of onomatopoetic words in English include noise-words such as [baʊwau] for *bow-wow* for the noise a dog makes, [mu:] for *moo* for a cow's noise, [splæt] for *splat* for the sound of a rotten tomato hitting a wall, [swif] for *swish* for the sound of a basketball dropping cleanly through the hoop (in "nothing but net" fashion), [kakədudldu] for *cockadoodle-doo* for the noise a rooster makes, and so on. Further examples include derivatives of noise-words, such as [kʊku] for *cuckoo*, a bird name derived from the noise the bird makes; [bæbl] for *babble*, a verb for the making of inarticulate noises derived from the perception of what such noises sound like; [brbl] for *burble*, a verb for the making of a rushing noise by running water derived from the sound itself, and so on. In all of these words, the matchup between the form of the word and the meaning of the word is very close:

(6) Cross-linguistic examples of onomatopoeia

| Sound | English | German | French | Spanish | Hebrew | Arabic | Mandarin | Japanese | Greek |
|---|----------------|------------|----------------------|----------------------------|----------------|--------------|----------|-------------|------------|
| Dog barking | [baʊwawəʊ] | [vawvwaw] | [wahwah] | [wawwww] | [hawhaw] | [fawə] | [waŋwaŋ] | [wāwā] | [ɣavɣav] |
| Rooster crowing | [kakə-dudl̩du] | [kikəriki] | [kokoriko] | [kikriki] or [kokoroko] | [kikuriku] | [kikiki:s] | [kukuku] | [kokekokko] | [kikiriku] |
| Cat meowing | [miaʊ] | [miaw] | [miaw] | [miaw] | [miaw] | [mawmaw] | [miau] | [niaw] | [nau] |
| Cow lowing | [mu:] | [mu] | [mø:] | [mu] | [mu] | [fū:] | [mər] | [mo:mo:] | [mu] |
| Sheep bleating | [ba:] | [mɛ:] | [be:] | [be:] | [mɛ:mɛ:] | [ma:?] [mɛ:] | [mɪɛ] | [mɛ:mɛ:] | [be:] |
| Bird chirping | [twit-twit] | [pip] | [kwikwi] | [pippip] | [tswitstswits] | [zægzæg] | [tçitci] | [tʃitʃi] | [tsiutsiu] |
| Bomb exploding | [bum] | [bum] | [brum] or [vrumb] | [bum] | [bum] | [bɔm] | [bɔŋ] | [bāŋ] | [mbum] |
| Laughing | [haha] | [haha] | [haha] | [xaxa] | [haha] | [qahqah] | [xaxa] | [haha] | [xaxa] |
| Sneezing | [atſu] | [hatſi] | [atſum] | [atſu] | [aptſi] | [fats] | [aʔtbi] | [hakʃɔŋ] | [apsu] |
| Something juicy hitting a hard surface | [splæt] | [patʃ] | [flæk] | — | [flo] | [?ax] | [pya?] | [guʃa?] | [plats] |
| Clock | [tiktæk] | [tiktik] | [tiktak] | [tiktak] | [tiktak] | [tiktrik] | [tiʔta?] | [tʃiktakṣ] | [tiktak] |

the meaning is very strongly suggested by the sound of the word itself.

BUT even in such onomatopoetic words, an argument for arbitrariness is to be found. While the form is largely determined by the meaning, the form is not an exact copy of the natural noise; roosters, for instance, do not actually say [kakədudl̩du] for *cockadoodle-doo* — English speakers have just arbitrarily **conventionalized** this noise in that form, i.e., speakers of English have tacitly come to agree that a connection exists between the meaning “noise of a rooster call” and the form [kakədudl̩du] for *cockadoodle-doo*. Moreover, when different languages imitate the same sound, they have to make use of their own linguistic resources. Different languages admit different sound combinations, so even the same natural sound may end up with a very different form in different languages, though each of the

forms is somewhat imitative. For example, a rooster says [kakədudl̩du] for *cockadoodle-doo* in English but [kukuku] for 咯咯咯 in Mandarin Chinese, even though (presumably) roosters sound the same in China as in America. If there were an inherent and determined connection between the meaning and the form of even onomatopoetic words, we would expect the same meaning to be represented by the same sounds in different languages. Thus, the strongest evidence for nonarbitrariness, namely, the existence of onomatopoetic words, is not quite so strong after all. In fact, a comparison of such words in different languages can even be used as an argument for arbitrariness in linguistic signs. To make this point more clearly, we have given in (6) eleven natural sounds that are represented by onomatopoetic words in nine languages. The similarity among them is expected, owing both to the nature of the

words and to the possibility of borrowing between geographically neighboring languages; still, the variation is also great.

b. Sound symbolism. In what may perhaps be considered a special subcase of onomatopoeia, it is often found that certain sounds occur in words not by virtue of being directly imitative of some sound but rather simply by being evocative of a particular meaning; that is, these words more abstractly suggest some physical characteristics by the way they sound. This phenomenon is known as **sound symbolism**. For instance, in many languages, words for ‘small’ and small objects or words that have smallness as part of their meaning often contain a vowel which is pronounced with the tongue high in the front part of the mouth (see File 3.4), which we will use the symbol [i] to represent the various spellings including *ee*, *i*, *y*. This occurs in English *teeny* ‘extra small’, *petite* and *wee* ‘small’, and dialectal *leetle* for ‘little’, in Greek *micros* ‘small’, in Spanish diminutive nouns (i.e., those with the meaning ‘little X’) such as *perrito* ‘little dog,’ where *-ito* is a suffix indicating ‘little’, and so on. Such universal sound symbolism—with the sound [i] suggesting ‘smallness’—seems to be motivated by the following factors. First, the high, front vowel [i] uses a very small space in the front of the mouth. Second, [i] is a high-pitched vowel and so more like the high-pitched sounds given off by small objects. Thus the use of [i] in ‘small’ words gives a situation where an aspect of the form, i.e., the occurrence of [i], is determined by an aspect of the meaning, i.e., ‘smallness,’ and where the form to a certain extent has an inherent connection with the meaning, even though not directly imitative in any way. We may thus characterize the appearance of [i] in such words as somewhat iconic—the “small” vowel [i] is an icon for the meaning ‘small(ness)’.

In addition to such universal sound symbolism, there are also cases of language-particular sound symbolism, in which some sound or sequence of sounds can come to be associated in a suggestive way with some abstract and vague but often sensory-based meaning. For example, in English, words beginning with the sounds [fl], spelled as *fl-*, such as *fly*, *flee*, *flow*, *flimsy*, *flicker*, and *fluid*, are often suggestive of lightness and quickness. Also, there are many words in English that begin with the sounds [gl] spelled as *gl-*, and refer to brightness (such as *gleam*, *glisten*, *glow* *glint*, *glitter*, and *glimmer*), as well as a group of words signifying a violent or sudden action that end in [æf] spelled as *-ash*, (such as *bash*, *mash*, *crash*, *flash*, and *splash*). In all such groups, an identifiable aspect of the form relates in a nonarbitrary way to the meaning.

BUT even in such cases, arbitrary aspects are again identifiable. Thus there are words that have the appropriate sequences of sounds but do not fit into the group semantically, such as *glove* and *glue* with respect to the [gl] (for *gl-*) group, or *sash* and *cash* with respect to the [æf] (for *-ash*) group. There are also words with appropriate meanings that do not fit in formally, such as *grid* or *hit*; note too that the English word [smɔl] for *small* does not contain the “small” vowel [i], but instead a relatively “open” or “large” vowel (think about what a dentist or doctor might tell you to say in order to get your mouth open wide, and compare that to the vowel of *small*). Also, from a cross-linguistic perspective, it turns out that other languages do not (necessarily) have the same clustering of words with similar meanings and a similar form. For example, the Greek words for ‘fly’, ‘flee’, ‘flow’, and ‘fluid’ are *petó*, *févyo*, *tréxo*, *iyró* respectively, showing that the *fl*- sound symbol is an English-particular fact and so cannot be a matter of a necessary and inherent connection between form and meaning.

1.4.4 ARBITRARY AND ICONIC ARE TWO EXTREMES ON THE CONTINUUM OF ARBITRARINESS

All in all, the above examples show that nonarbitrariness/iconicity have at best a somewhat marginal place in language. At the same time, though, it cannot be denied that they do play a role in language and moreover that speakers are aware of their potential effects. Poets often manipulate onomatopoeia and sound symbolism in order to achieve the right phonic impression in their poetry. For example, Alfred Tennyson in his poem *The Princess* utilized nasal consonants to mimic the noise made by the bees he refers to:

- (7) The *moan* of doves in *immemorial elms*
And *murmuring* of *innumerable* bees
(v. 11.206–7)

Similarly, the successful creation of new words often plays on sound symbolic effects. For instance, the recently coined word

[glitsi] for *glitzy*, meaning (roughly) ‘flashily and gaudily extravagant’, fits in well with the group of English words discussed above with initial sounds [gl] (spelled as *gl-*). It seems, therefore, that even though arbitrariness is the norm in language and is an important distinguishing characteristic separating human language from other forms of communication (see Chapter 2 on animal communication [in original text]), an awareness of nonarbitrary aspects of language is part of the linguistic competence of all native speakers and is worthy of study by linguists.

FURTHER READINGS

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Signs Have Parts: A Simple Idea

ROBBIN BATTISON

It was December of 1971 and I was flying from San Diego to Europe to attend some meetings and see some friends. I had been working with American Sign Language for about a year, and one of the books that I kept going through again and again was the Dictionary of American Sign Language. I decided to meet the principal author of that book as long as I was stopping in at Washington, D.C. Who knew when I would have a chance like that again? I called up Bill Stokoe and he invited me to lunch. At lunch, we chatted; he was friendly and full of ideas and wanted to know about mine.

He later surprised me when he wrote to offer me a job that summer (the Watergate summer of 1972) in the Linguistics Research Lab. Of course I accepted; the salary he offered was twice what I would have asked for. I

*Robbin Battison first became interested in Sign Language in 1970, while studying linguistics at the University of California, San Diego, and working in Ursula Bellugi's laboratory at the neighboring Salk Institute for Biological Studies. He spent the years 1973–1976 at the Linguistics Research Lab, Gallaudet College, and received his Ph.D. in Linguistics from UCSD in 1977. His dissertation, Lexical Borrowing in American Sign Language, was published in 1978. From 1976 to 1979, Robbin conducted research and taught American Sign Language in the Psychology Department of Northeastern University in Boston. Since 1979, he has pursued his interest in bureaucratic language and language comprehension as Manager of the Document Design Center at the American Institutes for Research in Washington, D.C. He edits a newsletter, *Fine Print, and other publications which discuss the language and design of public documents.*

made several false starts that first summer and actually wrote up very little of my research or my ideas; but the following year Bill asked me to come out again. After the second summer in the Lab, I did not return to graduate school in San Diego. After all, I had finished my course work, and at Gallaudet College I could write my dissertation while surrounded by hundreds of skilled signers, the people who could help me discover new things about this very peculiar language that I had chosen to study. I had some ideas but very little direction at this point. Bill gave me the support I needed to develop my ideas and to shape my work into something coherent. It took years . . .

INTRODUCTION

The thing that interested me most about Bill Stokoe was that he had hold of an exciting idea, one that clearly was going to lead somewhere. He said that Sign Language was a language like any other language and that it could be analyzed as a language. This simple idea contradicted many popular beliefs: for who could see similarities between the movements of hands and body and the audible sounds produced by speaking? What possible basis of comparison was there? And, as the argument went, even if they did have some casual similarity, we would still know that signed languages were fundamentally different from spoken languages: after all, signs

Source. Reprinted by permission of the publisher, from C. Baker and R. Battison, eds., *Sign Language and the Deaf Community* (1980): 35–51. Silver Spring, MD: National Association of the Deaf.

are like pictures drawn in the air with hands, aren't they, while words are quite abstract?

This is actually the crucial part of the argument, and the basic idea that Bill developed. Bill believed that the basic way to think of a sign was *not* as a picture, but as a complex and abstract symbol that could be analyzed into parts. This heretical idea contradicted what most experts had always said about signed languages, but eventually it took hold, because it opened new doors of understanding. Analyzing signs into parts allowed us to develop new theories about how signed languages work, where they came from, where they are going, and what is the best way to teach them. This simple idea also later influenced the way in which Sign Language is used in classrooms, and how it is used by interpreters. In this chapter I would like to give a short history of how this simple idea developed, the scientific inquiries that it inspired, and the social action and professional policies that derive from it. The story is not yet at an end.

SIGNS AS PICTURES

There are perhaps several reasons for the tradition of thinking of signs as pictures: they are visual; they involve space and size and shape; and they sometimes seem to represent things wholly and directly, just like a picture or a drawing. I would not argue against any of those very common observations. Signs are like pictures in many ways. But to stop there is to miss an important point. Saying that signs are like pictures is like saying that speech is like music. Spoken languages certainly have their musical aspects, but there are so many things about words and connected speech that are not like music—especially how they transmit meanings. There is more to signs than meets the eye; even if a sign does seem like a picture, that may not be the most important aspect of a sign to investigate.

There are several kinds of evidence which demonstrate that the pictorial or graphic nature of signs is not the most important aspect of Sign Language. First, several different kinds of experiments show that people who don't know Sign Language have a hard time guessing what very common signs mean, even in a multiple-choice test. Second, if we compare signs from different countries, we find that not everyone uses the same kind of gesture to represent the same meaning; in other words, different signed languages may represent the same thing with different kinds of gestures. Third, if we look very carefully at written and filmed records of older signs, we find that very often these signs have changed to become *less* graphic or picture-like, and have become more like a standardized gesture that must be pronounced in a particular way to be "just right." For example, the sign STUDENT (based on the sign LEARN) originally was made so that it seemed to create the image of taking something from a book and absorbing it into the mind; however, the modern sign looks very much like taking something and tossing it away! Fourth, sometimes even if you know what a sign means, you may find it hard or impossible to decide just exactly what pictorial image connects the meaning with the gesture. Some signs are just less pictorial than others.

For all these reasons and others (which are reviewed more carefully by Klima and Bellugi in their 1979 book) it is evident that we cannot learn very much or explain very much about Sign Language by depending on the weak idea that they are graphic pictures written in the air with the hands. There has to be something more.

WRITING ABOUT SIGNS

Bill Stokoe had a lot of faith in his ideas; that is, he always was a stubborn man, unwilling to change his opinions just because very few

people agreed with him. Faith and stubbornness are sometimes just two ways of looking at the same thing.

At first his ideas didn't make sense to anyone. Many respected experts (including some of the authors in this volume) dismissed his ideas as worthless; he was wasting his time. But knowledge comes step by step, and Bill Stokoe had a plan for studying Sign Language. First, he would need to describe the language in an elemental sense: he must write a dictionary. But before he could do that, he would need to write signs down on paper, in order to "capture" them accurately and describe how they are made. So first he would have to invent an adequate writing system—and that's where the idea began to take real shape.

In order to develop a transcription (writing) system for signs, Bill was forced to take a good hard look at how signs are made: what parts of the body move or don't move, how the fingers bend or extend, how the hands contact the body, where they touch, the speed and repetition of movements, and so on. If he could just think of a written symbol for each of the *important* elements in making signs, then he could write them down, collect signs, and begin even further analyses that could provide important information about these very strange communication systems.

Very early on, he proposed that every sign had at least three independent parts:

location— where on the body or in space is the sign being made? On the cheek, the chest, in front of the body, etc.?

handshape— how are the fingers extended and bent in this particular sign? Is the hand a fist, or does it have some fingers extended, etc.?

movement— how does the hand (or hands) move? In a circle, up-and-down, forward, etc.?

From his experience and training with other languages, Stokoe then made an assumption that turned out to be true. He assumed that within each of these three categories, there were probably a limited number of different ways of making these sign parts. For example, there might be ten different handshapes, or there might be one hundred; the important thing was that he could probably develop a list of all the possibilities, and then develop symbols for each one of them—the list was not going to be infinitely long. The same would be true of different locations and movements. The possibilities were not endless. There was probably a system to it, waiting to be discovered.

In the end, he came up with a system that worked: he had 19 different basic symbols for handshapes, 12 different basic symbols for locations, and 24 different basic symbols for types of movements. In much the same way that the symbols 0123456789 allow us to express any number, Stokoe now had a system that would allow him to express any sign on paper. He published a list of symbols and some of his early thoughts about how to use them in a thin volume in 1960 called *Sign Language Structure*. Table 1 shows the chart he published.

Regardless of how well this system captured the important parts of signs, it was an advance for the time, and it gave us some new tools to work with in probing Sign Language further. There were also practical applications. Using a transcription system, for example, a dramatist could use the transcription system to record exactly the signs needed for a play, a poem, or some other dramatic presentation; a Sign Language teacher could begin to organize lesson material according to which signs are similar, or which signs are different. The most important thing that Stokoe went on to create, however, was the first true dictionary of Sign Language. With Carl Croneberg

Table 1. Stokoe's Transcription Symbols

| Tab symbols | |
|---|---|
| 1. Ø | zero, the neutral place where the hands move, in contrast with all places below |
| 2. □ | face or whole head |
| 3. ▲ | forehead or brow, upper face |
| 4. △ | mid-face, the eye and nose region |
| 5. ▼ | chin, lower face |
| 6. 3 | cheek, temple, ear, side-face |
| 7. Π | neck |
| 8. [] | trunk, body from shoulders to hips |
| 9. \ | upper arm |
| 10. / | elbow, forearm |
| 11. ◊ | wrist, arm in supinated position (on its back) |
| 12. ▽ | wrist, arm in pronated position (face down) |
| Dez symbols, some also used as tab | |
| 13. A | compact hand, fist; may be like 'a', 's', or 't' of manual alphabet |
| 14. B | flat hand |
| 15. 5 | spread hand; fingers and thumb spread like '5' of manual numeration |
| 16. C | curved hand; may be like 'c' or more open |
| 17. E | contracted hand; like 'e' or more claw-like |
| 18. F | "three-ring" hand; from spread hand, thumb and index finger touch or cross |
| 19. G | index hand; like 'g' or sometimes like 'd'; index finger points from fist |
| 20. H | index and second finger, side by side, extended |
| 21. I | "pinkie" hand; little finger extended from compact hand |
| 22. K | like G except that thumb touches middle phalanx of second finger; like 'k' and 'p' of manual alphabet |
| 23. L | angle hand; thumb, index finger in right angle, other fingers usually bent into palm |
| 24. 3 | "cock" hand; thumb and first two fingers spread, like '3' of manual numeration |
| 25. O | tapered hand; fingers curved and squeezed together over thumb; may be like 'o' of manual alphabet |
| 26. R | "warding off" hand; second finger crossed over index finger, like 'r' of manual alphabet |
| 27. V | "victory" hand; index and second fingers extended and spread apart |
| 28. W | three-finger hand; thumb and little finger touch, others extended spread |
| 29. X | hook hand; index finger bent in hook from fist, thumb tip may touch fingertip |
| 30. Y | "horns" hand; thumb and little finger spread out extended from fist; or index finger and little finger extended, parallel |
| 31. 8 | (alloheric variant of Y); second finger bent in from spread hand, thumb may touch fingertip |
| Sig symbols | |
| 32. ^ | upward movement |
| 33. v | downward movement |
| 34. "n | up-and-down movement |
| 35. > | rightward movement |
| 36. < | leftward movement |
| 37. z | side to side movement |
| 38. τ | movement toward signer |
| 39. + | movement away from signer |
| 40. ± | to-and-fro movement |
| 41. a | supinating rotation (palm up) |
| 42. d | pronating rotation (palm down) |
| 43. ω | twisting movement |
| 44. η | nodding or bending action |
| 45. □ | opening action (final dez configuration shown in brackets) |
| 46. # | closing action (final dez configuration shown in brackets) |
| 47. ✕ | wiggling action of fingers |
| 48. Ⓜ | circular action |
| 49. ✗ | convergent action, approach |
| 50. ✖ | contactual action, touch |
| 51. ✚ | linking action, grasp |
| 52. ✪ | crossing action |
| 53. ✨ | entering action |
| 54. ✤ | divergent action, separate |
| 55. ✦ | interchanging action |

KEY

Tab = location

Dez = handshape

Sig = movement

and Dorothy Casterline, he collected, organized, and described more than 2000 different signs from the language he had begun to call American Sign Language. The dictionary was published in 1965.

We must remember the social and intellectual climate of fifteen years ago: many people were still denying that there was such a thing as a signed *language*. Certainly there was nothing that deserved the elegant title of American Sign Language (displayed in capital letters like that). And whatever kind of language it was, it was certainly nothing like the very large, complicated, and elegant spoken languages that were known in the world. As a matter of fact, some people belittled the language by referring to the dictionary and saying, "Only 2000 signs? This clearly indicates the impoverished, simple nature of Sign Language." What these people forgot is that our scientific knowledge of spoken languages has been developed and refined over several thousand years. By contrast, the scientific study of signed languages has only been progressing for twenty years, if we date it from Stokoe's first publication in 1960. We were only scratching the surface, so far.

Why was the dictionary so important? Surely there were other books that listed signs that deaf people use? But none were like this. A dictionary gives several different kinds of information about the words (or signs) of a language. For each *lexical entry* (separate word or sign), it gives: a coded physical description, telling us how to physically reproduce (pronounce) the word or sign; the meaning of that word or sign, including special nuances; the grammatical functions and properties of that word or sign, telling us how we might use it in a sentence and what variations we might expect depending upon its grammatical form; something of the history of that word or sign, especially a history that relates to other words or items in the

language. *The Dictionary of American Sign Language* gave us all that. Previous books had given us only scattered and incomplete (and sometimes misleading) information about signs and Sign Language. Without a writing or transcription system, signs cannot be faithfully reproduced, unless especially clever photos or illustrations are used (and they usually were not).

The Dictionary of American Sign Language was remarkable for another reason: the signs were arranged according to a principle of the language. Just as spoken language dictionaries arrange their words alphabetically (according to the order of the first letter, then the second letter of the word, and so on), Stokoe arranged his sign dictionary according to the parts of the signs that he used for transcription. Thus, this idea that signs are complex objects with parts not only led to a writing system, but also led to a principle of organizing all the signs that could be related to each other, depending upon which parts they shared. This is like the way we think of different words as being related if they share the same sounds, particularly at the beginnings of words. This arrangement also shows a lot of respect for the language.

Considering the obvious usefulness of Bill's analysis, the reader might expect that he received a lot of support for his work from members of the Deaf community and from professionals in the field of deafness. But this was certainly not the case. Why didn't his ideas catch on more rapidly? Why was there such resistance and even hostility to his ideas about analyzing, transcribing, and describing signs?

There are two interesting reasons for this lack of support that are not usually considered. The first reason concerns the prevailing attitudes among educators of deaf people and deaf people themselves. At that time, you must remember, Sign Language was only accepted if it could be justified as

a contribution to the educational system. Any new idea about Sign Language was discussed as a tool for classroom use. As several stories have it, students and faculty at Gallaudet and at some residential schools mistakenly assumed that they were going to be forced to learn this new transcription system for signs, and that all their books would be written in these complex symbols. Of course, nothing was further from the truth: the transcription system was intended as a scientific tool. But there were enough rumors and feelings going around to prevent anyone from really seeing the transcription system as Bill had intended it.

The second reason was a strategic error on Bill's part. Bill gave new technical names to the things he was describing. Perhaps he didn't realize that he was creating resistance to learning when he gave complex names to simple and familiar things. He referred to *dez*, *tab*, and *sig* when he could have simply said *handshape*, *location*, and *movement*. Some people were probably put off by these strange words and had some difficulty learning what they meant and keeping them separate; I certainly did, and I worked hard at it.

PARTS OF SIGNS

Comparing, grouping, and classifying signs according to what parts they have in com-

mon and what parts they don't is not simply a convenience for organizing dictionaries. Like words, signs must be broken up into parts in order to perceive what they mean. This is especially true of the kinds of complex signs that Ursula Bellugi describes in the next chapter, but it is also true of very simple signs.

Just as we know that the two English words "skim" and "skin" are different words with different meanings, we know that they are *minimally different*. That is, the only difference between these two words is the final sound unit: "m" or "n." Of course we can find thousands of these *minimal pairs* (pairs of words that differ in only one *minimal* way). From them we can determine what types of sound units play an important role in distinguishing meanings in a spoken language. We can do the same with a signed language.

We can find minimal pairs of signs that differ in only one aspect of their production. For the aspect of handshape, there are pairs of signs that are identical except for their handshape. An example is the pair of signs CAR and WHICH (Figure 1). The only difference between them is that CAR has a fist with the thumb closed against the knuckles, while WHICH has a fist with the thumb extended. In the case of location, a minimal pair of CHINESE and SOUR (Figure 2). The

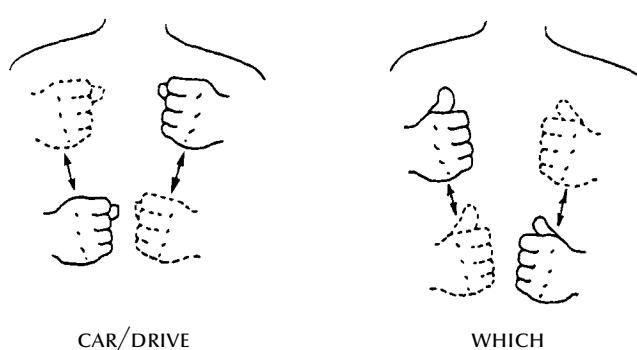


Figure 1.

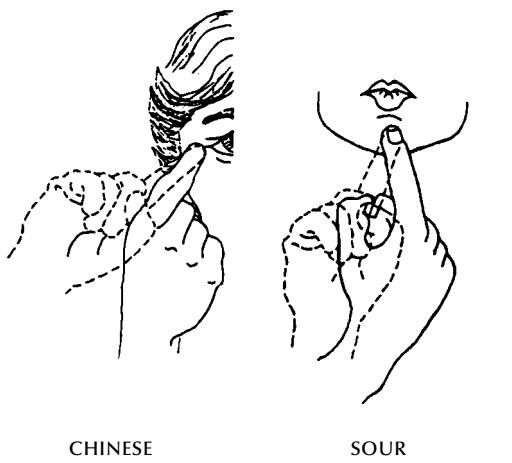


Figure 2.

two signs are identical except that CHINESE is made on the temple or high on the cheek and SOUR is made near the mouth.

A minimal pair for movement is found in NAME and SHORT (Figure 3). NAME is made with simple contact (sometimes repeated), while SHORT is made identically except for its brushing motion of the upper hand. Figure 3 also shows that the *orientation* of the hands might also be a distinctive aspect of signs. The pair of signs NAME and CHAIR differ only by their orientation: in NAME, both palm surfaces point towards the body, but in CHAIR the palm surfaces point downward. These and many other examples of minimal pairs show that there are critical

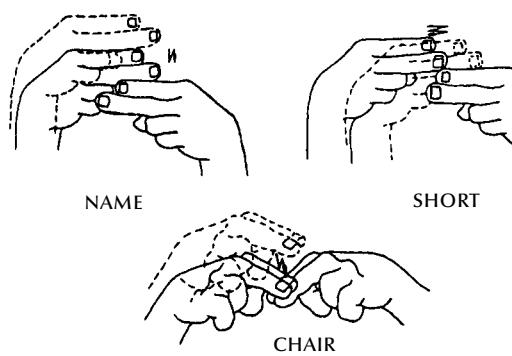


Figure 3.

parts of a sign that allow us to distinguish it from other signs.

There is also reason to think that this is not just a convenient way to speculate about words and signs. This kind of division into parts seems to reflect the way deaf native signers think in signs. Several memory experiments with both spoken and signed languages have shown that the errors people make when trying to recall lists of vocabulary items are frequently related to the other member of a minimal pair. In a spoken experiment, for example, someone who heard “vote” might later recall it as “note;” in a signed experiment, someone might see the sign TREE (with the hand completely open and fingers extended and spread, the entire upright forearm shakes on its axis) but later recall it as the sign NOON (same gesture, without the shaking). The same principles of analysis into parts seem to guide the structure and use of signed languages and spoken languages.

There are several other different types of constructive arguments that are based on an analysis of signs into component parts like the one that Stokoe proposed. If we are trying to argue that signs are not simply random gestures that our bodies just happen to be able to perform, and if we also want to argue that a sign does not have to be a “picture” and does not have to “graphically” represent an idea or an object, then we might look for some other factors or forces that determine how signers use their hands and their bodies to make signs.

From work with spoken languages, it is well known that the individual sounds in a language and the way those sounds can come together to make words in a language are always only a small portion of what humans are able to articulate. Not every possible vocal sound is used in a spoken language. Of the sound units that a language uses, not every possible combination of these

units is used to form syllables or words—many are unlikely or impossible combinations, such as “frtps.” This is because sounds and their combinations are governed and limited by psychological and physiological laws relating to the speech organs, and by the way that the ear takes in and processes information.

It is easy to show that the same kinds of principles determine how the different elements of signs—handshapes, locations, and movements—can come together (or *co-occur*) to form complete signs. Of course, some things are quite impossible to do with the hands because of physical limitations. But what about things that are *possible*, but *too complex and unnatural* for the kind of rapid signing that is common in conversation? Are there such things? Linguistic research has shown that there are.

The example I will offer here is from some work I did while studying how signs limit the ways that different parts can occur together. (At that time, I was looking for something parallel to what we call *morpheme structure constraints* in spoken languages.) In ASL, as in all signed languages that we know about, many signs are made with both hands. Logically then, the handshapes could either be the same (for example, two fists), or they could be different (for example, a fist on the left hand and a “V” shape on the right hand). As it turns out for the signs that I studied, there are a number of rules and predictions that you can make on the basis of the handshapes used in signs made with both hands. For example, if the two handshapes are different:

- only one hand will move during the sign—usually the “dominant” hand.
- the hand that does not move will not be just any one of dozens of handshapes—it will be one of the simplest, or most natural, handshapes (the closed fist, the open palm, the open hand with fingers spread,

the fist with index finger extended, the “O” hand, or the “C” hand).

This kind of limitation, which is observed in other signed languages as well as in ASL leads to several further observations. First, the limitation is systematic and excludes large numbers of possible hand arrangements; there are only a very few existing signs which break the two “rules” above. Second, there seems to be a physiological reason for the way these “rules” operate: complex and moving things are most often on the dominant hand; simple and static things will most often be on the nondominant hand (the one that is usually not as skilled in doing things). Other reasons may include perceptual factors, such as how many different things the eye and the brain can take in and keep track of when a person watches signs. There is quite a bit of evidence that perceptual limitations play a role in “shaping” possible signs.

There is no need here to continue listing and describing the many different kinds of constraints that people have hypothesized for the structure of signed languages. For the purposes of this paper, the important theoretical point is that these constraints are like those that explain how spoken languages operate: the forms of a language are constrained by physiological and perceptual factors on the production and perception of spoken words and gestural signs.

There are practical observations that are linked to this small set of rules. Consider the problem that faces many professionals who work with signs, especially teachers of young deaf children. Very often teachers will want a sign for a particular word or a concept, but they don’t know what that sign is, or even know if it exists. Occasionally, they will appropriately ask several skilled signers to determine what they should sign. Much

more often, they will either fingerspell the word or invent their own sign.

Now, what about all these signs that get invented? Many schools have continuing discussions in committees whose main purpose seems to be to invent signs. But are these invented signs appropriate? Do they fit the natural rules of how signs can be constructed out of parts? The answer is that many of the invented signs, particularly the signs that have been invented to transliterate English words, are unnaturally complex. Many of the signs that have been invented for children, including the names of animals and toys, violate some of the rules that natural signs obey. The results of this situation have been observed by many people in many different places: both children and adults have difficulty learning how to make the signs; both children and adults tend to change the signs, to pronounce them in a little more natural way; and experienced signers often view some of these signs as being unnatural ("they don't fit in"), and in some cases peculiar, silly, or even crude. The lesson is quite clear: we should study how deaf people use signs in a conversational context, and we should pay attention to the detail of how the signs are made. Only then, and only cautiously, should anyone attempt to invent a sign on their own—and only as a last resort.

EXTENDING THE IDEA THAT SIGNS HAVE PARTS

The first summer working in the Linguistics Research Lab was one of exploration and discovery for me. Contrary to what I expected, Bill did not order me to carry out a specific research plan; he didn't order me to transcribe videotapes, and he didn't have me compiling information from dusty books on a hot summer day. He allowed me to think about what I wanted to do, and to take it

from there. I kept thinking about breaking signs down into parts and comparing them; I knew that this would be the way to discover all sorts of things about signing, and that this would provide a basis for comparing signs with words. That summer, Lynn Friedman (another summer research assistant) and I began to talk about another level of structure. We knew that it was interesting and useful to think of signs broken down into handshapes, locations, and movements . . . but what was beyond that? What was a handshape? What was a movement, really? These things could also be analyzed into finer parts, and perhaps that division would be useful too. We felt that if we could isolate the different levels of structure of a sign, we might compare them to the different levels of structure of a word. We felt that a word corresponded to a sign pretty well, and the three aspects that Stokoe had discovered might correspond roughly to individual sounds in a spoken word. But we also knew that even individual sounds were composed of finer parts called *distinctive features*, and perhaps we would also find a corresponding level of structure in signs.

Distinctive features in spoken language can refer to many things, but for our purposes here I might say that they refer to different *acts* that the vocal organs (mouth, lips, tongue, etc.) perform in order to make the sounds of language. For example, the feature of *lip rounding* is a distinctive feature of many sounds in many languages. We felt that we might discover a similarity, so we began by breaking down handshapes into features that we called *bent* (if the fingers were bent), *crossed* (if some of the fingers crossed each other), *spread* (if the fingers were not touching each other), etc. We eventually came up with a preliminary analysis of features for handshapes, locations, and movements, and we later pursued this track of investigation more thoroughly in our ways.

By now you may be asking yourself, “Why bother breaking down signs into finer and finer details?” The answer is that we were creating a tool for understanding how Sign Language works. Since all of us were continually trying to think of new ways to get valid and meaningful information about signs, it made sense to at least experiment with the very lowest, very finest level of description: how different parts of the body had to arrange themselves and move in order to compose a sign. It was also good practice for learning how to describe signs adequately, and eventually might help us sort out what were the important, as opposed to the unimportant, parts of signs.

The second set of reasons had to do with the general strategy among sign researchers at the time. We were always looking for familiar things that would help alert us to how signs really worked. Since spoken languages had been studied for many centuries, there was a set of traditions (sometimes misleading) and set of theories (sometimes conflicting) about how human beings managed to move their mouths and tongues and make sounds, and how they could listen to those sounds and somehow form the impression that the other person had given them information. There is something magical about it, after all. But for spoken languages, we had at least made a dent in the problem. There are large dictionaries of spoken languages and many scholars who study those languages. Even elementary school children learn something about grammar and composition in their classrooms. More importantly, there is a vocabulary of technical terms for discussing spoken languages. The natural thing to do, although cautiously, was to try to find things in signed languages that looked like, or seemed to act like, familiar things in spoken languages. In this way, we were trying to answer the question: “In what ways are signed languages like

spoken languages?” If we kept finding similarities despite their different production mechanisms (the hands and body versus the voice) and despite their different perceptual mechanisms (the eyes versus the ears), then we would feel sure that we were somehow getting closer to discovering ways for producing and perceiving language that all humans share, regardless of whether a given human can hear or not. Any time that a researcher did find a similarity, it might lead that researcher onto a very productive path. This was true of the distinctive feature analysis. As it turns out, allowing us to think about distinctive features of signs allowed us to make a connection to three different kinds of psychological studies that had been done with spoken languages. These offered researchers three new bases for comparing signs and words as people actually used them.

The first kind of study concerned psychological processes like perception and memory. Experiments had showed that the “inner language” of the mind may operate in terms of something like distinctive features. This led to a whole series of investigations by various researchers on the memory and perception of signs.

The second type of study concerned the effects of brain damage on language production and perception. Some of the descriptive work on hearing people who have suffered brain damage used an analysis of distinctive features; this work could now be extended to studies of deaf people (usually elderly) with brain damage.

A third type of study was even more exciting than the other two. People who study “slips of the tongue” (everyday speech errors) have found that these errors help us understand how the brain controls the parts of the body that express speech and language. One of the only ways to describe some of the errors is in terms of distinctive features. This

suggested a new avenue of investigation for sign researchers, who then began to study “slips of the hand,” or sign errors.

The point of these little anecdotes is not to inform you about distinctive features. The point is to show the logical progression of ideas leading to further ideas and action.

I think it is very easy to show, for example, that the original idea that signs have parts influences the ways in which we think about the grammar of a signed language. Just to take one point, many writers have said (even into the 1970's) that a signed language has no distinction between nouns, verbs, and adjectives, as spoken languages do. The truth is quite the opposite, as Ursula Bellugi explains [in the original volume]; we just weren't paying attention to the right parts of the sign. Normally, a spoken language will add some additional sounds to a word (a suffix or prefix) to indicate whether it functions as a noun or a verb in the sentence. For example, “claw” can be either a noun or a verb, but “clawed,” “clawing,” and “de-claw” can only be verbs. Anyone who looked for signs that “added on” bits of signs in this way was disappointed, because there weren't any. But as Ted Supalla later noticed, there are systematic differences between nouns and verbs in American Sign Language: they are expressed as different types of movement. Bellugi describes this in greater detail in her chapter. I only raise the point now to show how one observation can build on, and make use of, another. Once movements had been separated (in a sense) from other parts of signs, it became easier to notice different roles that individual movements might play.

Another way that we can use the information about the structure of individual signs is when we try to decide if two different “pronunciations” of a sign make two different signs, or if they are just alternate pronunciations of the same sign. This becomes an

issue when we consider what an “idiom” is in American Sign Language. Without discussing it in any great detail, we can show that things that are often called sign “idioms” are often just ordinary signs that are difficult to translate into English (see similar comments in Hansen's paper on Danish Sign Language [in original volume]), or are signs that are confused with other signs. For example, some people claim that the sign SUCCEED has an idiomatic or special meaning, “finally” or “at last.” But these two signs are made differently: SUCCEED has two distinctive movements, while the sign that I call AT-LAST has only one sharp movement. If two signs are made differently, and have different meanings, this is good evidence that they are separate signs. So AT-LAST is not an idiom, even though it might historically derive from the sign we call SUCCEED. One of the ways ASL expands its vocabulary is through such changes in movement. Again, we see one more reason for paying attention to the fine details of how signs are formed.

This is just one example of how the term “idiom” has been often misused when it is applied to Sign Language; the effect is often to obscure how the language really works, and to make it seem as if the language is unstructured and simple. Of course, nothing could be further from the truth.

CONCLUSION

In this essay I have described some of the research findings that have come out of the last twenty years of thinking about the structure of signed languages. This description has pointed out a few general principles and a few practical results that have sprung from a very simple idea: signs have parts. The discussion has also shown that when we investigate signed languages, we find many parallels to the structure of spoken languages. I think that this will become a very significant

factor in how we hearing people think about deaf people, and in how deaf people think about themselves. It is becoming harder and harder these days to maintain that Sign Languages are very "simple" and "primitive." On the contrary, they are very rich and complex systems. Future investigations in which signing and speaking are compared will tell us more about the wonderful capacity the mind has to deal in abstract symbols.

In closing, let me say that simple ideas are usually the most valuable ones. The work that Bill Stokoe began more than twenty years ago, and which he continues today, has produced ideas that have generated interest among scholars everywhere. They have led to a re-examination of policies and attitudes towards deaf people; they have contributed to the emergence of deaf people as a cultural group; and they have let all of us, deaf and hearing, come a little bit closer to each other.

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Introduction to A Dictionary of American Sign Language

WILLIAM C. STOKOE, DOROTHY C. CASTERLINE, AND CARL G. CRONEBERG

1. THE ELEMENTS OF AMERICAN SIGN LANGUAGE

A first look into a dictionary may be more perplexing than enlightening to one unfamiliar with the language, but even those readers who know American Sign Language best will find this dictionary strange at first because the language has never before been written. It is written here and can be written because of what we know of its structure. Each sign of this language has three things which distinguish it from all other signs in the language. Let us call these things *aspects* since they are ways of looking at something that can happen all at once. The three aspects of a sign are (1) the place where it is made, (2) the distinctive configuration of the hand or hands making it, and (3) the action of the hand or hands. In the early stages of the structural analysis of this language it was decided to call the place the *tabula* or *tab*, to call the active hand the *designator* or *dez*, and the action it made the *signation* or *sig*. These three terms, *tab*, *dez* and *sig* are used throughout the dictionary as brief and convenient labels for the three aspects of signs. The reader who becomes completely familiar with them and the aspects of signs they refer to will find his thinking and reading about signs and his study of unfamiliar signs in the dictionary entries made much easier.

What happens when a person makes a sign may be described in many different

ways, from a kind of telegraphic mention of some essentials to a leisurely description of every detail of the activity. To supplement written descriptions of signs line drawings and photographs have long been used, but these can show only a static moment in the process of signing. To indicate sig motion dotted lines, arrows drawn on the film, double exposures, and sequences of views have been used—none really successfully. Full representation of signs in motion pictures is unsatisfactory too, for it is expensive, cumbersome, and essentially artificial. Although it is usual to deal with languages, especially in dictionaries, a word at a time, a language is really a whole of which words are somewhat artificial parts. Users of sign language find it harder to get what a person is signing in a carefully made motion picture than what a live signer is signing. When a film is cut to separate individual signs, that difficulty is increased. One sign blends or merges with another as a signer proceeds. Students of other languages are aware of the same difficulty. We write: “I want to see what he is doing to them,” but we say and hear something more like: “aywannaseewoteesdointoem.”

1.1 Writing American Sign Language

With the understanding that all separation of real human communication into word-size units is a little artificial, we can proceed

Source. Reprinted by permission of the publisher, from W. C. Stokoe, D. C. Casterline, and C. G. Croneberg, *A Dictionary of American Sign Language* (rev.). (1976): vii–xxx. Silver Spring, MD: Linstok Press. The appendices referred to in this reading can be found in the original volume.

to a representation of the separate signs of the American sign language by symbols for the three elemental aspects of a sign. If we use “T,” “D,” and “s” as cover symbols for any possible tab, dez, and sig, we can write a sign thus: TD^s. This formula or convention for writing a sign indicates that at or in some place (T), visibly distinguished from all other sign language places, a hand configuration (D), distinctly different from all others used in sign language, performs an action (s), visibly unlike all other such actions.

Not all signs are made in just this way, because the sig may be a combination of movements. Some signs will be written like this: TD^s_s. Here two sig actions are combined; that is they are done at the same time. Thus “down” and “touch” (ꝝ) written one above the other will indicate that the dez moves down while in contact with the tab. In other words it grazes, brushes, or scrapes down across the tab. Or two straight-line sigs, ‘right’ and ‘down’ (ꝝ), done together combine to make a motion downward and to the signer’s right.

Another kind of formula shows the sig symbols side by side: TD^{ss}. This way of writing a sign indicates that one sig action is done first and a second follows.

A third kind of formula shows two dez symbols: TDD^s. This way of writing a sign indicates that both the signer’s hands serve as a double dez. A double-dez sign like this may have a single sig symbol as shown or have a compound (ꝝ) or a double (ss) sig. Indeed, some double-dez signs and some with single dez may have three sig symbols (ss) or (sss) and some even four (sss).

All that is needed now to read a sign written in the dictionary is a knowledge of what specific symbols may be used to replace these general cover symbols in the formulation, and a knowledge of what visible aspects of sign activity are represented by the specific symbols. The fifty-five symbols shown

in the following table (and on the endpapers for handy reference) may seem more burdensome to learn than the English alphabet of twenty-six symbols. But the writing of signs is both simpler and more consistent than English spelling. Our conventions of spelling in English allow o-u-g-h to have five separate pronunciations, for instance, and one vowel sound may be spelled with *e*, *ee*, *ei*, *ie*, *ea*, *ae*, *ay*, *i*, *y*, *oe*, and otherwise. The fifty-five symbols used to write American sign language stand for just fifty-five things visibly unlike all the rest. Moreover, grouping within the fifty-five helps to learn the symbols and what they stand for.

The first twelve symbols stand only for tab aspects. The next nineteen stand for hand configurations used as dez and some of these are also used as tab. Most of this group of nineteen will be immediately recognized by the reader who knows and uses the American manual alphabet, but appearances are misleading.

The dez and tab hand configurations of American sign language are similar to but not identical with the configurations of finger spelling. In finger spelling the configurations and the direction in which the hand and fingers point must be kept within very close limits, but in American sign language the configuration symbolized “A” for instance may look more like the “s” or the “t” of the manual alphabet than the “a,” or it may look like nothing used in finger spelling at all—depending on what sign is being made, on who is making it, or on where he learned the language. Again, the sign language configuration symbolized “H” may look at times like the manual alphabet “h” or “u” or “n,” depending on the direction the fingers point as the dez moves in making the sig.

The last twenty-four of the symbols in the table below stand for sig aspects only and divide into subgroups. First there are four

subgroups of three symbols each, showing a similar relationship within the subgroup. Vertical motion, for instance, might be considered one sig and given one symbol; but some signs are identical in every respect except that the sig of one is upward motion, of another downward motion, and of a third up-and-down motion. The same three-way distinction, of sideways motion, of to-and-fro motion, and of rotational motion of the fore-arm gives three more of these subgroups of three members. The last seven of the twenty-four symbols for sig motion also form a sub-group as they all indicate interaction between the tab and dez of a sign or between the two hands of a double-dez sign.

1.2 Table of Symbols Used for Writing the Signs of the American Sign Language

Tab symbols

1. Ø zero, the neutral place where the hands move, in contrast with all places below
2. ☐ face or whole head
3. ☑ forehead or brow, upper face
4. ☒ mid-face, the eye and nose region
5. ☓ chin, lower face
6. ☔ cheek, temple, ear, side-face
7. ☕ neck
8. [] trunk, body from shoulders to hips
9. ☖ upper arm
10. ☗ elbow, forearm
11. ☘ wrist, arm in supinated position (on its back)
12. ☙ wrist, arm in pronated position (face down)

Dez symbols, some also used as tab

13. ☚ compact hand, fist; may be like 'a', 's', or 't' of manual alphabet
14. ☛ flat hand
15. ☜ spread hand; fingers and thumb spread like '5' of manual numeration
16. ☝ curved hand; may be like 'c' or more open
17. ☞ contracted hand; like 'e' or more claw-like
18. ☙ "three-ring" hand; from spread hand, thumb and index finger touch or cross

19. ☚ index hand; like 'g' or sometimes like 'd'; index finger points from fist
20. ☛ index and second finger, side by side, extended
21. ☜ "pinky" hand; little finger extended from compact hand
22. ☝ like ☚ except that thumb touches middle phalanx of second finger; like 'k' and 'p' of manual alphabet
23. ☞ angle hand; thumb, index finger in right angle, other fingers usually bent into palm
24. ☢ "cock" hand; thumb and first two fingers spread, like '3' of manual numeration
25. ☣ tapered hand; fingers curved and squeezed together over thumb; may be like 'o' of manual alphabet
26. ☤ "warding off" hand; second finger crossed over index finger, like 'r' of manual alphabet
27. ☥ "victory" hand; index and second fingers extended and spread apart
28. ☦ three-finger hand; thumb and little finger touch, others extended spread
29. ☧ hook hand; index finger bent in hook from fist, thumb tip may touch fingertip
30. ☨ "horns" hand; thumb and little finger spread out extended from fist; or index finger and little finger extended, parallel
31. ☩ (allocheric variant of ☨); second finger bent in from spread hand, thumb may touch fingertip

Sig symbols

32. ^ upward movement
33. v downward movement
34. n up-and-down movement
35. > rightward movement
36. < leftward movement
37. z side to side movement
38. t movement toward signer
39. a movement away from signer
40. x to-and-fro movement
41. ☚ supinating rotation (palm up)
42. ☛ pronating rotation (palm down)
43. ☜ twisting movement
44. ☝ nodding or bending action
45. ☞ opening action (final dez configuration shown in brackets)
46. ☠ closing action (final dez configuration shown in brackets)
47. ☡ wiggling action of fingers

- | | |
|---|-------------|
| 48. $\textcircled{\text{o}}$ circular action 49. $\textcircled{\text{x}}$ convergent action, approach 50. \times contactual action, touch 51. $\textcircled{\text{x}}$ linking action, grasp 52. $\textcircled{+}$ crossing action 53. $\textcircled{\text{o}}$ entering action 54. $\textcircled{+}$ divergent action, separate 55. $\textcircled{''}$ interchanging action | interaction |
|---|-------------|

1.3 Conventions of Writing American Sign Language

When the tab, dez, and sig of a sign have been identified as three or more of the fifty-five aspects in the table above, that sign has been uniquely described and the appropriate symbols should suffice to show it in written formulation in this order: TD^S. However, a few additional symbols and some conventions of using the symbols to write signs have been adopted to make the notation more explicit.

First, many signs begin with the tab and dez or the two hands of the double dez in a particular relationship. This may be looked at as a stage in the process of sig action, but in writing signs it is easier to show it as part of the tab-dez picture. Thus when one hand rests on or is held above the other, the symbol for the lower hand will be shown with a line above it, as in $\overline{\text{AA}}^{\textcircled{\text{o}}}$ “coffee.” A line below the symbol indicates that the hand represented is uppermost as in AA^{\times} “assistant” (the dot over the dez is explained below). A vertical line between the symbols indicates that the hands are side by side, close together or touching, as in $\emptyset\text{A}^{\textcircled{1}}\text{A}^{\times}$ “with.” A subscript symbol (q) between indicates that one hand is held, with or without contact, behind the other, as in $\emptyset\text{A}^{\textcircled{0}}\text{A}^{\perp}$ “follow.” A cross, the same symbol used for “crossing” sig, between configuration symbols indicates that as the sign begins the forearms, wrists, hands, or fingers are crossed as in $\emptyset\text{B}^{\textcircled{+}}\text{B}^{\textcircled{-}}$ “divide.” The symbol for “linking” sig used in this way indicates initially clasped hands or fingers as in $\emptyset\text{F}^{\textcircled{*}}\text{F}^{\textcircled{o}}$ “cooperate,” and the

symbol for entrant sig indicates one configuration within the other, as in $5\textcircled{0}\text{G}^{\textcircled{o}}$ “begin.”

Second, sig symbols written as subscripts to tab or dez symbols will show the way the hand or hands are held. Hence, the sign translated “school” is written $\text{BaBd}^{\times\textcircled{-}}$ to show that the tab is supinated, turned palm up, and the dez is pronated, turned palm down. A different sign, translated “money,” is written $\text{BaBa}^{\times\textcircled{-}}$; in it both hands are palm up. The dot after the sig symbol is explained below.

Third, some special features of a configuration may need noting. Thus a dot above a tab or dez symbol shows that the thumb or other finger not usually prominent is extended or used in the sig action, as in $\textcircled{\text{A}}^{\textcircled{+}}$ “not.” Again, if the configuration is displayed or used with the fingers bent it will be shown with a triple mark (III) above, as in $\text{BaCd}^{\textcircled{+}}$ “rough.” When the forearm is prominent, the “forearm” tab symbol is placed before the configuration symbol, as in $\emptyset\text{B}^{\textcircled{1}}\text{G}^{\textcircled{o}}$ “always.”

Three other marks are used to show sig action more explicitly than may be done with sig symbols alone. A dot above the sig symbol indicates a short, sharp, tense or checked movement, as in $\triangle\text{V}^{\times}$ “strict.” A dot used to the right of a sig symbol indicates a repetition of the whole sig, as in $\text{BaBd}^{\times\textcircled{-}}$ “school.” Two dots indicate two or more repetitions, as in $\text{B}^{\textcircled{1}}\text{B}^{\textcircled{2}}$ “often.” A curve (~) after the sig symbol indicates that the sig action of the hands in a double-dez sign is done first by one then by the other, as in $\emptyset\text{FF}^{\textcircled{-}}$ “if.”

When the sig includes the actions “open” or “close,” the dez configuration changes, and, to show what the hand becomes, the new dez symbol may be shown in brackets, as in $\cap\text{B}_{<}^{\#}\text{[A]}$ “forget.”

Some signs occur in pairs, or rarely triplets, for a single concept. These compounds, analogous to compound words or word-phrases of English are shown with a symbol (::) between to indicate the compounding.

The foregoing explanation of the system with the table of symbols should adequately introduce written signs to a user of American sign language. However, for the reader who does not already know the language, the following photographic illustrations may be more enlightening.

1.4 Illustrations of Tab and Dez Notation

No attempt has been made here to illustrate sig aspects. Only carefully made mo-

tion picture studies or observation of actual signing can give an adequate idea of the nature of sig action and the wide variation a sig action may show and still be accepted as the same.

Note that right and left may be reversed. Although the photographs show the right hand as dez and the left, when used, as tab, any sign may be made with dez left- and tab right-handed. Signers who are left-handed often use left hand as dez; and in a long utterance, as in interpreting for a nonsign-



Tab Ø Dez A



Tab Ø Dez A



Tab ∩ Dez 5



Tab □ Dez C



Tab ∪ Dez E



Tab ∃ Dez F



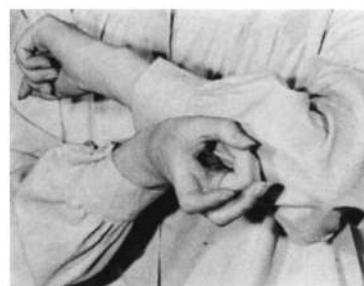
Tab II Dez G



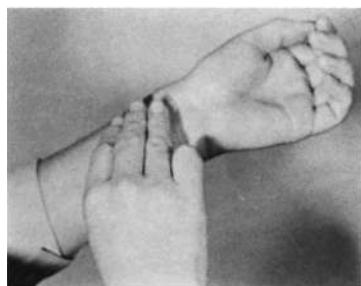
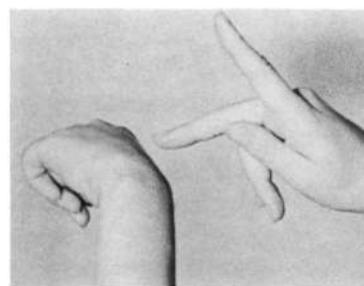
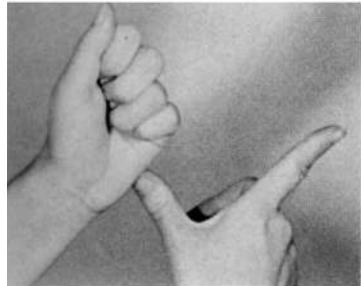
Tab [] Dez L



Tab \ Dez H

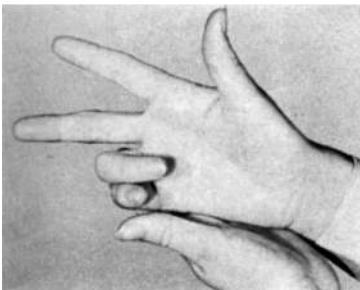
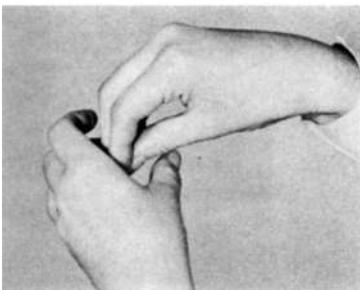
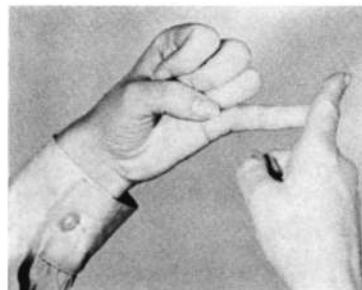


Tab \ Dez V

Tab Q Dez W_DTab D Dez K_V

Tab A Dez L

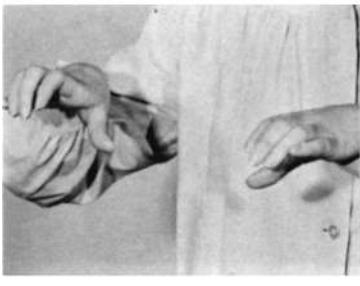
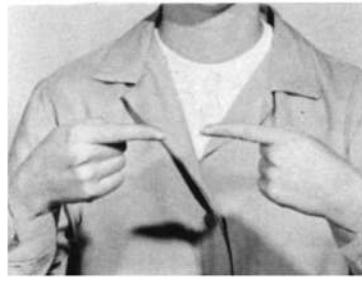
Tab B_d Dez B

Tab \bar{B}_a Dez 3Tab \bar{B}_a Dez γ_b Tab C Dez Q_v 

Tab I Dez G

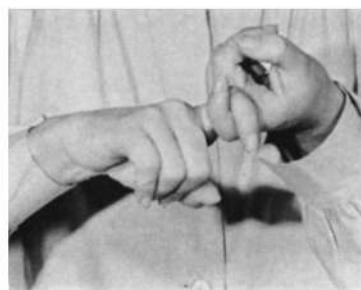


Tab Ø Dez Å

Tab Ø Dez \sqrt{B} Tab Ø Dez $C_v C_v$ Tab Ø Dez $G>G<$



Tab Ø Dez R



Tab Ø Dez XX



Tab Ä Dez A



Tab Ä Dez Ä



Tab Ø Dez A¹A



Tab Ø Dez A₂A



Tab Ø Dez B¹B



Tab Ø Dez √A¹√A



Tab Ø Dez F̄x F



Tab 5° Dez G



Tab B̄a Dez B̄p



Tab B̄a Dez B̄a



Tab U Dez Å



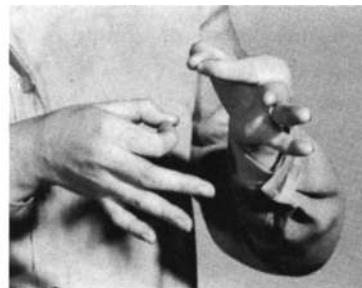
Tab B̄a Dez C̄p



Tab Ø Dez JḠa



Tab u Dez V̄

Tab B^I Dez B^{II}

Tab Ø Dez FF



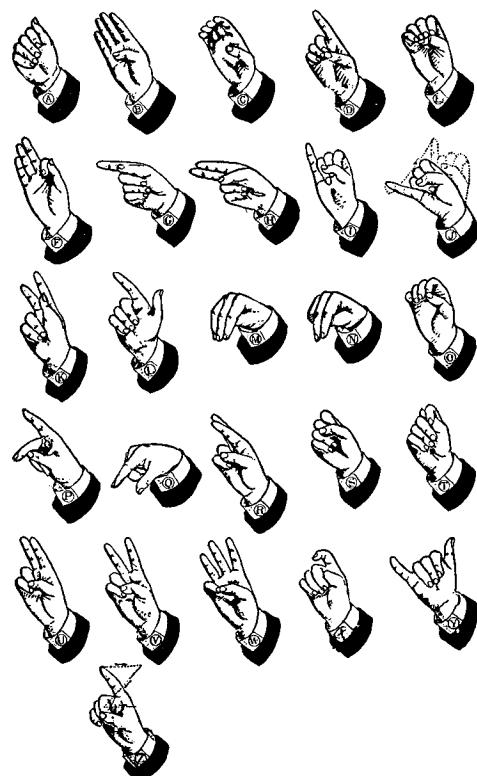
Tab C Dez BC

Tab C Dez A_C

ing speaker, even a right-handed signer may change to the use of left hand as dez. Most of the illustrations show the dez and tab as it would be seen by one to whom the sign is addressed. To show some configurations clearly, however, the camera has looked over the signer's shoulder, picturing the dez nearly as the signer himself would see it.

1.5 Table of the American Manual Alphabet

Although finger spelling, a one-for-one representation of alphabetical symbols, and sign language are totally different modes of communication, many of the hand configurations are shared or similar. Furthermore there are signs that use as dez the alphabetical configuration of the initial letter of the English gloss. For these reasons a table showing the configurations of the manual alphabet is reproduced on this page.



American Manual Alphabet

2. THE DICTIONARY ENTRIES

An entry in the dictionary will give information on some or all of these points:

- 1 the sign in symbols
- 2 variants of the sign
- 3 the nature of the sign
- 4 notes on how the sign is made
- 5 special usage indications
- 6 syntactic value: N , V , X
- 7 glosses, English equivalents
- 8 notes on usage, related signs, examples
- 9 cross-reference.

2.1 The Sign in Symbols

Signs in the dictionary are listed in the order of the symbols used to write them. This is the order shown in 1.2, Table of Symbols, and also in the endpapers. Thus signs with the same tab are arranged according to the order of their dez symbols, and signs with the same tab and dez are arranged according to the order of their sig symbols.

2.2 Variants of the Sign

Following the main listing at a little distance are shown variants of the sign which are either slightly different ways of making the sign or different ways that the same sign may be written.

2.3 Nature of the Sign

After the variants or after the sign itself if none are shown, a parenthesis may occur. The first item within parentheses is an indication of the nature of the sign, when this can be given with assurance. Most signs, like the words in any language, are associated with a meaning simply because users of the language use them so. However, American Sign Language uses visible human activity instead of sounds, hence there may of-

ten be a relationship of some kind between a sign and its referent. Onomatopoeia, the imitation in language sounds of the sound referred to (*buzz*, *quack*, *hum*, etc.) has a parallel in sign language, but the ways that signs relate to their referents may be distinguished:

Pantomimic signs, like all signs of American sign language, have tab, dez, and sig; but together these make an action which represents itself. Thus “knock” $\emptyset A^+$ is a sign but is also exactly what a person does when knocking on a door. Again “cold” $\emptyset AA^X$ may be accepted as a likely reaction of anyone feeling cold. Real pantomime has no more place in signing than chanting has in speaking but the label will be shown wherever there is a reasonable supposition that the sign has a pantomimic origin.

Imitative signs are similar to pantomimic except that they single out some feature or object of the whole meaning to imitate more or less closely. Thus “car” and “drive” $\emptyset AA^N$ imitate the hands gripping an imaginary wheel but still represent the rest of the car or the whole activity of driving it. Again in “pipe” $\cup Y^X$ the dez hand itself indicates the object but there is no attempt in signing “pipe” to pantomime the whole activity of smoking. In the sign “dance” $BaVv^z$ the sig indicates, does not pantomime, the action while the dez indicates the legs of the dancer. Here the sig is as much smaller than the real action of dancing as the dez hand is smaller than the body; but in “amazed” $\emptyset VbVa^+$ the hands and fingers imitate the jaws and teeth dropping open in amazement so that the sign is larger, not smaller, than the imitated action.

Metonymic signs are occasionally marked as a special class of imitative signs which pick a relatively unexpected fea-

ture or object of the whole meaning to represent or imitate.

Indicative signs are not always so labeled in the dictionary, for the action of pointing toward the referent makes further indication redundant. It should be noted, however, that there are different degrees of indicative signs. The signs for "I" and "me" are made close to the referent; the latter usually makes actual contact with the signer's body. But the sign for "you" indicating several persons simply sweeps an arc that more or less precisely indicates the width of the group. Still further from direct and tactile indication are the signs for third person which do not require the referent or referents to be present or visible.

Name signs form a special class, not only because they are unique appellations for individual persons but also because they use a set of tab, dez, and sig aspects somewhat different from those of other signs. See Appendix B.

Initial-dez signs are coinages to translate a particular English word and have as dez the manual alphabet configuration for the first letter of that word. Although this is an open class and still used in coinage of new signs, it is by no means an innovation. The American sign language signs for colors, the days of the week, for *wine*, and others are direct translations from cognate French signs and use different initials of course when the English spelling differs. Many of the earliest French initial-dez signs can be attributed with certainty to the Abbe de l'Epée who describes his inventions of *signes méthodiques* to augment the *signes naturelles* in use by Parisian deaf-mutes in the eighteenth century.

2.4 Notes on How the Sign Is Made

For the reader who knows American Sign Language the symbolic notation will suffice to indicate a sign and may even, with

its subscripts and modifications, be a redundant symbolization. However, for those who use the dictionary as an aid to learning the sign language, the symbols alone may not be enough to allow exact reproduction of a sign. Therefore, within the parentheses in the entry are notes on the special features of tab, dez and sig, if these need further explanation. These notes for the sake of concision are expressed in terminology taken from structural linguistics. Explanation of the terms will be found in Section 3 below.

2.5 Special Usage Indications

Most signs are used and may be used in any situation where sign language may be used, and these signs need no special marking. There are, however, signs which are seen invariably or usually in *formal*, *religious*, *platform* (public or academic lecture), *dramatic*, *colloquial*, or *humorous* contexts. These will be so labeled within the parentheses. Other signs are known to be locally rather than nationally used and will be labeled *local*, *dialectal*, or *regional* with further specification where possible. Within the categories above there are also subdivisions. Since several denominations conduct religious work with the deaf and have their own traditions of translating liturgical and scriptural language into signs, the special usage label may be *Roman Catholic*, *Lutheran*, and the like, instead of the general *religious*. There is no attempt to list exhaustively all the signs peculiar to denominational linguistic communities. Some sign language manuals approach this task. See "Bibliography," Appendix E.

2.6 Syntactic Value

Although the description of the grammatical and syntactical structure of a language cannot be adequately given piecemeal in

dictionary entries, each entry does indicate by the use of labels “N,” “V,” and “X” whether the sign is of the sort which may be used alone or as the center of a phrase of nominal, verbal, or adjectival-adverbial function. A full discussion of these matters will be found in Appendix A, “American Sign Language Syntax.” At times the similarity of an idea expressed in English and in American sign language may lead one to suppose more structural parallels than really exist. Moreover, the practice of glossing signs with English words may mislead one to suppose that the sign and word are grammatical as well as semantic counterparts. However, both suppositions are fallacious; and even though a noun, for instance, is used to gloss a sign, it is more accurate to understand from the label “N” that “this sign has nominal uses” than to classify it mentally as a noun and so engraft the whole “parts of speech” concatenation on a language which has a different system of syntax.

2.7 Glosses, English Equivalents

A dictionary of American Sign Language could conceivably contain no words of English at all, just as a dictionary of English might have no words of any other language within its pages. However, two considerations have kept this dictionary from being made on such strict lines. First, it is hoped that it will have some usefulness as a bilingual dictionary and yet avoid the most serious errors such hyphenated works fall into. Its users may be especially interested in the problem of translating from English into ASL or the reverse. They will therefore give careful consideration to these remarks and to the appendices in which the grammar and syntax of sign language are described. Second, American Sign Language is in a different case from those languages like

French, Spanish, and Italian that coexist with English in American communities. The deaf user of ASL, no matter how pure his sign language usage among his deaf fellows, is also a part of the general American culture and no further justification should be needed for the commingling of sign language and English in these pages.

Therefore, following the syntactic label in each entry will be given one or more English words which will, at least sometimes, adequately translate the sign. However, the reader is warned, here generally and in the entries specifically, that there may be uses of the signs that the word will not translate and uses of the word for which the sign would be inappropriate.

2.8 Notes on Usage, Related Signs, Examples

Because single word glosses for a sign are so often inadequate and approximate, there follows in many entries a note on the kind of context in which the sign will be used, the environment in which the gloss will serve, and the uses of the gloss which the sign will not fit. These are followed often with examples in sign phrases or sentences and the translations of the latter. In these notes considerable reference will be made to other signs, synonyms, or signs of similar structure.

2.9 Cross-Reference

Finally, many entries conclude with a reference to one or more other signs in the dictionary. These references are intended to help the user of the dictionary find several entries, which taken together, will cover a certain semantic ensemble; will show signs related in their aspects but distinct in meaning; or will lead to a longer entry, an article in which a number of related signs are discussed and differentiated.

There is another kind of cross-reference as a feature of the dictionary. At the back will be found an alphabetical list of the words used as glosses. These are followed by numbers that refer to the page on which the sign so glossed may be found.

3. SIGN LANGUAGE STRUCTURE¹ AND VARIATION

In linguistics a first consideration is the *phonology* of any language under study, what sounds it uses as its elemental units and how they are selected and used. Language sounds, *phones*, are rigorously classified into *phonemes*, classes of language sounds whose members are called *allophones* (the suffix *-eme* for “same,” and the prefix *allo-* for other). All the sounds—which will be different if measured phonetically—that constitute one phoneme are allophones of that phoneme and are treated by the speakers of the language as alike. Thus the vowel of *hat*, *had*, and *has* is a phoneme, even though its allophone in *hat* is very short and its allophone in *has* is two or three times as long. An even more striking illustration of this sameness with a difference is furnished by the English of Chinese speakers whose own language has sounds like English “l” and “r” as allophones of the same phoneme. To them “flied lice” is no different from *fried rice*.

For the scientific description of a language, especially that actual production of language a linguist observes, a set of distinct symbols for each of the phonemes of the language is necessary and sufficient. However, a strictly phonemic writing system would not be practical. If a speaker sometimes says /blows/ and sometimes says /blowz/ for the same garment (*blouse*) the writing will have to have two ways to spell the same thing. And if speakers from different regions or so-

cial strata differ in “pronunciation,” a phonemic writing system will be full of different spellings; for instance: *brush*, *bresh*, *bersh*; *just*, *jist*, *jest*, *jerst*; *idea*, *idear*, *idee*, *ijea*. A more practical system of writing, and one that much more accurately accounts for the social phenomena of languages, is *morphophonetic*.

A *morphophone* is a unit of language out of which the minimum meaning bearing units, *morphemes*, are made. A morphophone is *actualized* as one or another phoneme. Thus the “u” in *just* represents a morphophone of English which some speakers actualize as the phoneme /e/, some as /i/, some as /u/ and some as /ə/. Allowing for individual and dialect differences in actualization, morphophones serve to represent the language of those whose speech is different yet mutually intelligible, just as phonemic symbols represent classes of allophones that have phonetic differences.

3.1 Cheremes and Allocuers

The nature of sign language structure is not very different from that of spoken language structure, once account is taken of the vocal-visual difference. Sign language uses, not sounds, but visible distinct elemental units. Looked at simply as different things to see, the activity of signing can show infinite variety. However, sign language, like other language, puts these many things into classes. Analogous with the *phoneme* is the sign language *chereme* (CARE-eem, the first syllable from a Homeric Greek word meaning “handy”). It is a class of visual units that may differ in visible ways but that are just the same in their use in American Sign Language. These units, *allocuers*, may look so different to one unaccustomed to the language that he misses the essential fact that they are the same. For example, the

dez chereme symbolized in this dictionary as “Y” may look like the hand configuration for “y” in the manual alphabet—that is one allocher. It may have the three middle fingers only loosely curled—that is another allocher of “Y.” It may have the three middle fingers at right angles with the palm—still another. It may have the forefinger and little finger parallel and extended, the thumb either bent or extended—two more allochers. All these allochers are represented by the cheremic symbol “Y.” Some of them are in free variation; others are selected automatically (are in complementary distribution) according to the tab and sig used with them in signs. Thus “mistake” which ends with the middle of the dez against the chin uses the tightly curled fingers, but “why,” which begins (for some signers) with the middle fingers of the dez lightly brushing down the forehead, selects the open allocher of “Y.”

There is a chereme somewhat like “Y.” But this, like other cheremic contrasts, produces a different sign, while the allocheric differences merely mean “a different way of making that sign.” It is symbolized “8.” It too has allochers: open with the hand rigid, the middle finger at right angles to the rest; tense, the middle fingernail caught by the ball of the thumb; and lax, the tips of middle finger and thumb lightly touching. The problem in writing sign language, and in recording it in a dictionary is to take account of such differences but at the same time not to treat as different those things that users of the language react to as same.

3.2 Morphophonics

The concept of the morphophone and morphophonic notation, which allows for interchange, alternation, and replacement of phonemes, was first publicly enunciated (by

Henry Lee Smith, Jr., at the January 1965 meeting of the Washington Linguistics Club) after much of this dictionary had been completed. The symbols used herein for the elemental units, cheremes, of signs cover allocheric differences at least. The user of the dictionary, aware of the morphophonic concept, may find it very helpful to think of the notation, however, as “morphocheric,” that is, a sign printed with “Y” for dez may sometimes be seen with an allocher of “8,” or even of “B.” This kind of variation is easier to find and describe than to account for in a writing system serving all users of a language. Just as the southern American English speaker’s identical pronunciation of *pin* and *pen* does not negate the many primary contrasts between /i/ and /e/, so the actual occurrence of American Sign Language in one signer’s performance does not negate the primary contrasts the editors have observed and recorded. In short, *pin* and *pen* are spelled differently in English and yet may be said as different or as same in actual use. So too the signs listed in this dictionary as using different cheremes may have different or the same cheremes in actual use. This caution, to be aware of same-ness and difference simultaneously and at different levels, is needed in any study of language, more especially in one so different in nature from other languages but so similar in submorphemic structure.

3.3 Variation and Flexibility

The reason for introducing such technicalities of linguistic theory into a dictionary of sign language is eminently practical. Almost all that has been put into print about American Sign Language gives, intentionally or not, the impression that a sign must be made precisely so, will always be seen made that way, and admits of no variation. Nothing

could be further from the truth. Individual, local, regional, and other differences operate at all levels in all languages. One person's "idee" is another's "idear" even though they both write *idea*. Just so, one person's "Y" will look like another's "I." Once the student of American Sign Language grasps the nature of the "allo-" and "-eme" distinctions, he will be in a much better attitude for learning and understanding than if he

expects all sign language activity to look like what some person or book lays down as *the sign*.

NOTES

1. For a more detailed treatment see Stokoe, "Sign Language Structure: An Outline of the Visual Communication System of the American Deaf," *Studies in Linguistics, Occasional Papers*: 8. Buffalo, N.Y., 1960.

File 3.1: What Is Phonetics?

Phonetics is the study of speech sounds. The communication of meaning through a sequence of speech sounds involves the following: First of all, a speaker encodes meaning into sounds, which he or she produces using the tongue, lips, and other articulatory organs. These sounds are transmitted through the air to reach the hearer. Then, the hearer perceives them through auditory processes, finally translating them back into meaning. There are, therefore, three aspects to the study of speech sounds: **articulatory phonetics**, the study of the production of speech sounds; **acoustic phonetics**, the study of the transmission and the physical properties of speech sounds (such as intensity, frequency, and duration); and **auditory phonetics**, the study of the perception of speech sounds.

The study of articulatory phonetics has had the longest history among the three sub-branches of phonetics; it was already fairly developed by the nineteenth century. In the popular musical *My Fair Lady*, based on Bernard Shaw's play *Pygmalion*, the eccentric professor Higgins was actually modeled after the phonetician Henry Sweet. Acoustic phonetics, however, has mostly developed only in the past few decades. Acoustic phonetics has had to rely heavily on the use of sophisticated instruments that perform analyses of sound vibration. A particularly im-

portant instrument, the **spectrograph**, was invented only in the 1940s. Among the three branches of phonetics, auditory phonetics is the least understood, owing to gaps that remain in our understanding of human neurology and perception.

One of the most interesting aspects of phonetics, the study of spoken language, is figuring out which sounds are possible in speech. You can make a plethora of different noises with your mouth (as any five-year-old knows), but only a subset of these noises are used in human language. Phonetics seeks to understand why some mouth noises exist in language while others do not. One thing we've learned is that what seems possible or natural in speech is often influenced by our own native language. This linguocentric (usually western Eurocentric) bias can only be countered by open-mindedness and objectivity.

In this chapter, we will be learning and using a system of phonetic symbols that linguists have developed for representing speech sounds. Among the three branches of phonetics, we will mostly be looking at articulatory phonetics, which involves the study of how speech sounds are produced by speakers and the description and classification of those sounds according to their properties. For the most part in the upcoming Files, we will be talking about the speech

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sounds of English, since most users of this book are probably familiar with this language. To see what other possible speech

sounds there are in other languages, we will also take a look at the phonetics of non-English speech sounds.

File 3.2: Representing Speech Sounds

3.2.1 “YOU SAY TOMATO, I SAY TOMAHTO”

“You’re not from around here, are you?” Sometimes you can tell by the way a person pronounces words that he or she speaks a dialect that is different from yours. For example, some people do not pronounce *pin* differently from *pen*. In some parts of Ohio the word *push* is pronounced with a vowel sound like the one in *who*. If you hear someone say *poosh* you can guess where they are from. Such pronunciation differences have been noted for many thousands of years. For example, there is a story in the Bible (Judges 12:4–6) about a group who used a password that their enemies could not pronounce correctly. The pass word they used was *shibboleth*, since their enemies couldn’t say the “sh” sound. This group would kill anyone with the telltale pronunciation *sibboleth*. These illustrations show that pronunciation is a part of what we know when we know a language and that it can in some circumstances be a matter of life and death.

Before we call the whole thing off, let’s consider some ways of studying pronunciation in spoken language.

In recent years, phoneticians have begun to employ some very sophisticated instrumental techniques to study spoken language. For example, the **sound spectrograph** is used to study speech acoustics. A sound spectrograph is a powerful tool that can make pictures of speech. These pictures

help acoustic phoneticians explore physical theories of how the mouth makes sounds. These days you can download sound editing and analysis software from the web. Try searching for a “waveform editor” or an “audio spectrograph” and see if you find any free software for looking at and editing sound waves on your computer.

Speech articulation is studied with **X-ray photography** and cinematography, among other techniques. More recently, to avoid methods that expose talkers to dangerous amounts of radiation, phoneticians have used point-tracking devices such as the X-ray microbeam or the electromagnetic articulograph to track the locations of small receptors glued onto the lips, tongue, and jaw. Articulatory phonetics is also done with **palatography** to observe contact between the tongue and the roof of the mouth, and instruments to measure airflow and air pressure during speech.

These instrumental phonetic methods supplement **impressionistic phonetic transcription**—a much simpler method of phonetic analysis which is our focus in this textbook. An example of phonetic transcription is given in the heading of this section. The word *tomato* is pronounced differently by different people, and we can symbolize two of the pronunciations as “tomato” and “tomahto” as Ira Gershwin did when he wrote the lyrics of “Let’s Call the Whole Thing Off.” Or we could follow the pronunciation

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guide in *Webster's Third New International Dictionary* and write the two pronunciations as tə'mātō and tə'måto. Or we could refer to the *American Heritage Dictionary*, where the two pronunciations are written təmā'tō and təmä'tō. Confusing, isn't it? Yet we need to use phonetic transcription because the normal spelling of the word doesn't tell us enough about how it is pronounced by different people.

| <i>Spelling</i> | <i>Gershwin</i> | <i>Webster's</i> | <i>Amer.</i> <i>Heritage</i> |
|-----------------|-----------------|------------------|---------------------------------|
| tomato | "tomato" | tə'mātō | təmā'tō |
| tomato | "tomahto" | tə'måtō | təmä'tō |

3.2.2 THE "RIGHT" PHONETIC ALPHABET

Did Gershwin write the two pronunciations of *tomato* correctly? Or does one of the dictionaries have the right way to symbolize the difference? It should be clear that there is no one "right" answer about how to write pronunciation in a phonetic transcription. The choices we make are largely arbitrary or influenced by typographical or historical considerations. However, it is absolutely crucial that both the reader and the author agree on the sound qualities that are assigned to the symbols in a phonetic alphabet. This is why almost all dictionaries give some guide to the pronunciation symbols where they list familiar words as examples of the sounds. For example, *father* is used to illustrate the sound intended by <å> in *Webster's* and by <ä> in the *American Heritage*. Whether the <a> has one mark or two is an arbitrary decision. This is fine, so long as we have a pronunciation guide.

Here are some other features of a useful phonetic alphabet. (1) Each symbol represents one sound only, and there is only one symbol for each sound. The letter "c" violates this principle in English spelling because it represents two sounds (the [k] sound in *cat*, and the [s] sound in *cymbal*, and both

[k] and [s] in *cynic*). (2) If two sounds can distinguish one word from another they should be represented by different symbols. English "th" violates this principle because the difference between the "th" sounds in *thy* and *thigh* is not captured by using "th" for both words. (3) If two sounds are very similar and their difference arises from the context they are in, they should be represented by a single symbol. For example, the [k] sounds in *keep*, *cart*, and *cool* are different from each other in that their actual places of articulation are affected by the following vowel, but these [k] sounds aren't written with different symbols.

The English spelling system is not a good phonetic alphabet because:

- sometimes the same sound is spelled using different letters, such as the [i] sound in *sea*, *see*, *scene* *receive*, *thief*, *amoeba*, *machine*, and *Aesop*;
- sometimes the same letters can stand for different sounds, as in *sign*, *pleasure*, and *resign*, or *charter* and *character*, or *father*, *all*, *about*, *apple*, *any*, and *age*;
- sometimes a single sound is spelled by a combination of letters, as in *lock*, *that*, *book*, *boast*, *mountain*, *shop*, *apple*, or *special*;
- sometimes a single letter represents more than one sound, as in *exit* or *use*;
- sometimes letters stand for no sound at all, as in *know*, *doubt*, *though*, *island*, *rhubarb*, or *moose*.

Phonetic transcription, however, is consistent and unambiguous because there is always a one-to-one correspondence between sounds and symbols. This is even true across languages, so that the symbols you will be learning can be used to transcribe the sounds of any language.

In this book we use the International Phonetic Alphabet (IPA for short). For our purposes this phonetic alphabet is the

right one to use because it is applicable to all spoken human languages, rather than just English, and it has all of the properties of a “useful phonetic alphabet” discussed above. Here’s what Anthony Burgess (the author of *A Clockwork Orange* and other novels) had to say about the IPA. “I propose that the reader become familiar with the International Phonetic Alphabet, or IPA. The reader may shudder in advance, but we have to do something about the accurate visualization of speech. I have the idealistic vision of phonetic symbols being added to our daily stock of alphabetic signs, so that I may tap the symbol /ə/ on my typewriter or word processor when I want to represent

the sound that begins *apart* or ends *Asia.*” (*A Mouthful of Air* [New York: Quill, 1992], pp. 26–27.)

3.2.3 PHONETIC SYMBOLS FOR ENGLISH

Phonetic symbols are written in square brackets, [], to distinguish them from letters or words written in ordinary spelling. It is important to remember that these symbols are not the same as letters of English. Rather they represent the sounds of language. (a) through (c) below give the phonetic symbols for the sound inventory of General American English.

a. Consonants

Symbol Sample Words

| | | |
|------|--|----------------|
| [p] | pit, tip, spit, hic <u>cough</u> , appear | |
| [b] | ball, globe, am <u>ble</u> , brick, <u>bubble</u> | |
| [t] | tag, pat, stick, pterodactyl, <u>stuffed</u> | |
| [d] | dip, card, <u>drop</u> , loved <u>,</u> batted | |
| [k] | kit, scoot, <u>character</u> , critique, exceed | |
| [g] | guard, bag, longer, designate, Pittsburgh | |
| [?] | uh-oh, hat <u>rack</u> , Batman, before each of the vowel sounds in uh-oh | (glottal stop) |
| [f] | foot, laugh, <u>philosophy</u> , coffee, carafe | |
| [v] | vest, dove, gravel, any <u>il</u> , aver <u>age</u> | |
| [θ] | through, wrath, thistle, ether, teeth <u>h</u> | (theta) |
| [ð] | the, their, mother, either, teeth <u>e</u> | (eth [ɛð]) |
| [s] | soap, psychology, pack <u>s</u> , descent, peace | |
| [z] | zip, roads <u>s</u> , kisses <u>s</u> , Xerox, design | |
| [ʃ] | shy, mission, nation, glacial, sure | (esh, [ɛʃ]) |
| [ʒ] | measure, vision, azure, casualty, decision | (yogh) |
| [h] | who, hat, rehash, hole, whole | |
| [tʃ] | choke, match, feature, constituent | (t-esh) |

| | | |
|------|---|-----------------|
| [dʒ] | judge, <u>G</u> eorge, Jell-O, region, residual | (d-yogh) |
| [m] | <u>moose</u> , <u>lamb</u> , <u>smack</u> , <u>amnesty</u> , <u>ample</u> | |
| [n] | <u>nap</u> , design, <u>snow</u> , <u>know</u> , <u>mnemonic</u> | |
| [ŋ] | <u>lung</u> , <u>think</u> , <u>finger</u> , <u>singer</u> , <u>ankle</u> | (engma) |
| [l] | <u>leaf</u> , <u>feel</u> , <u>Lloyd</u> , <u>mild</u> , <u>applaud</u> | |
| [r] | <u>reef</u> , <u>fear</u> , <u>Harris</u> , <u>prune</u> , <u>carp</u> | |
| [ɾ] | writer, <u>butter</u> , <u>udder</u> , <u>clutter</u> , <u>cuter</u> | (flap) |
| [w] | <u>with</u> , <u>swim</u> , <u>mowing</u> , <u>queen</u> , <u>twilight</u> | |
| [ʍ] | <u>which</u> , <u>where</u> , <u>what</u> , <u>whale</u> , | (voiceless 'w') |
| | <u>why</u> (for those dialects in which <i>witch</i> and <i>which</i> do not sound the same) | |
| [j] | <u>you</u> , <u>beautiful</u> , <u>feud</u> , <u>use</u> , <u>yell</u> | |

b. Syllabic Consonants

| | | |
|------------------|---|----------------|
| [m] | <u>possum</u> , <u>chasm</u> , <u>Adam</u> , <u>bottomless</u> | (syllabic 'm') |
| [n] | <u>button</u> , <u>chicken</u> , <u>lesson</u> , <u>kittenish</u> | (syllabic 'n') |
| [l] | <u>little</u> , <u>single</u> , <u>simple</u> , <u>stabilize</u> | (syllabic 'l') |
| [ɾ] ¹ | <u>ladder</u> , <u>singer</u> , <u>burp</u> , <u>percent</u> | (syllabic 'r') |

c. Vowels

i. Monophthongs

| | | |
|------|--|---------------|
| [i] | <u>beat</u> , <u>we</u> , <u>believe</u> , <u>people</u> , <u>money</u> | |
| [ɪ] | <u>bit</u> , <u>consist</u> , <u>injury</u> , <u>malignant</u> , <u>business</u> | (capital 'i') |
| [e] | <u>bait</u> , <u>reign</u> , <u>great</u> , <u>they</u> , <u>gauge</u> | |
| [ɛ] | <u>bet</u> , <u>reception</u> , <u>says</u> , <u>guest</u> , <u>bury</u> | (epsilon) |
| [æ] | <u>bat</u> , <u>laugh</u> , <u>anger</u> , <u>comrade</u> , <u>rally</u> | (ash) |
| [ʊ] | <u>boot</u> , <u>who</u> , <u>sewer</u> , <u>duty</u> , <u>through</u> | |
| [ʊ̇] | <u>put</u> , <u>foot</u> , <u>butcher</u> , <u>could</u> , <u>boogie-woogie</u> | (upsilon) |
| [ȯ] | <u>boat</u> , <u>beau</u> , <u>grow</u> , <u>though</u> , <u>over</u> | |
| [ɔ̇] | <u>bought</u> , <u>caught</u> , <u>wrong</u> , <u>stalk</u> , <u>core</u> | (open 'o') |

1. The “r” sound (i.e., alveolar retroflex liquid – see section 3.3.1b in File 3.3) for English is symbolized as [ɾ] in standard IPA. However, borrowing the symbol [r] (used to transcribe trill sounds in the dental/alveolar/postalveolar region in standard IPA) to transcribe the English “r” sound is common in dictionaries and in literature for typographical reasons. This textbook follows this common practice; where confusion is likely, we use the symbol [r] as used in standard IPA.

- [a] pot, father, sergeant, honor, hospital
- [ʌ] but, tough, another, oven (wedge)
- [ə] among, sofa, Asia (schwa)

ii. Diphthongs

- [aɪ] bite, Stein, aisle, choir, island
- [aʊ] bout, brown, doubt, flower, loud
- [ɔɪ] boy, oily, rejoice, perestroika, annoy
- [oʊ] boat, beau, grow, though, over
- [eɪ] bait, reign, great, they, gauge

File 4.1: What Is Phonology?

Both phonetics and phonology can be generally described as the study of speech sounds. **Phonetics**, as we learned in the previous section, is more specifically the study of how speech sounds are produced, what their physical properties are, and how they are interpreted. **Phonology**, on the other hand, investigates the organization of speech sounds in a particular language. While we might find the same sounds in two or more languages, no two languages organize their sound inventories in the same way. An example will make this point more clearly.

In both Japanese and English we can hear the sounds [s] and [ʃ]. The Japanese word [ʃimasu] ‘do’, contains both phones, as does the English word [slæʃ] *slash*. The difference between Japanese and English lies in the way the two sounds contribute to the meaning of a word. In English, the two phones can distinguish meaning, as shown by words like [ʃɔr] *shore* and [sɔr] *sore*, where alternating between [ʃ] and [s] affects the meaning of the utterance. In this sense, phonologists say that the occurrence of these two sounds is unpredictable, since we cannot look at the rest of the word and determine which sound will occur. That is, if we know that a word in English ends in [ɔr], we cannot predict whether the word will start with [s] or [ʃ] since both *sore* and *shore* are different, but possible, words.

In Japanese, on the other hand, these two sounds are predictable from their environment. Sounds are predictable when we expect to see one sound or the other based upon the sounds that precede or follow it. If we know that a Japanese word contains the sound [i], we know that it can be preceded by [ʃ], but not by [s] — the combination [si] does not occur in Japanese. However, in English we cannot make this prediction: the sound [s] does appear before the sound [i], as in [si] *see*.

So while Japanese and English contain the phones [s] and [ʃ], the languages differ in that in Japanese we can predict the occurrence of one versus the other and in English we cannot. If someone learning Japanese were to use [s] before [i], the meaning of the word would not change. Instead, a native speaker of Japanese would probably think that the speaker sounded funny or had an accent. On the other hand, if a learner of English were to make the same substitution in English, then the meaning of the word is likely to change. Imagine confusing [s] and [ʃ] and saying “I have to [seyv] more money each month.”

Phonologists ask these kinds of questions: What is the organization of sounds in a given language? Of all the sounds in a language, which are predictable and which are unpredictable? What is the phonetic con-

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text that allows us to predict the occurrence of certain sounds? Which sounds affect the meaning of words? In the following files, we

will learn how to answer these questions by examining the sound systems of English as well as other languages.

File 4.2: The Value of Sounds: Phonemes

4.2.1 ALLOPHONES AND PHONEMES

In every language, certain sounds are considered by native speakers to be the “same” sound, even though they may be phonetically distinct. For example, native speakers of English consider the [l] in *lay* to be the same sound as that in *play*, even though the former is voiced and the latter is voiceless (see File 3.3 for an explanation of voicing). Or, if you ask a native speaker of English how many different sounds are represented by the underlined letters in the words *pin*, *bin*, and *spin*, they will probably say “two,” grouping the aspirated [p^h] of *pin* and unaspirated [p] of *spin* together. Though [p^h] and [p] are phonetically different sounds, native English speakers typically overlook this difference and consider them to be the “same” sound.

One of the goals of this file is to understand more clearly the distinction between “same” and “different” sounds. To do this, we will discuss the terms **allophone** and **phoneme**. Since these concepts are the crux of phonological analysis, it is important that they be clearly understood. Perhaps the best way to explain these terms is through examples. On a separate piece of paper, transcribe the following five words:

top stop little kitten hunter

It is likely that you transcribed all of these words with a [t], like the following:

[tap] [stap] [lit] [kit^t] [hʌnt^t]

This is good, since it reflects something that is psychologically real to you. But, in fact, the physical reality (the acoustic phonetic fact) is that the ‘t’ you transcribed in those five examples is pronounced slightly differently from one example to the next. To illustrate this, pronounce the five words again. Concentrate on what the ‘t’ sounds like in each example, but be sure to say them as you normally would if you were talking to a friend.

What differences did you notice? Compare, for example, the /t/ of *top* to that of *stop*. You should be able to detect a short burst or puff of air after the /t/ in *top* that is absent in *stop*. That puff of air is called **aspiration**, which we will transcribe with a superscripted [h]. So while a native speaker would consider the ‘t’ sound in *top* and *stop* to be the same sound, the ‘t’ is actually pronounced differently in each word. This difference can be captured in the transcription, as in [t^hap] and [stap], respectively.

Now say the word *little* and *kitten*. We might say that the ‘t’ in *little* sounds a lot “softer” than the one in *stop*, and is clearly voiced. For most speakers of American English (but not of British English), the ‘t’ in words like *little* is pronounced as a flap, [ɾ], much like the *r* in Spanish in words like [para] ‘for’ and [toro] ‘bull’. English *kitten*, on the other hand, is pronounced with the

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same sound we hear in the expression “uh-oh,” a glottal stop [?]. So, we could transcribe *little* and *kitten* as [lɪrl] and [k^hɪʔn̩], respectively.

For some speakers of American English, in casual speech words like *hunter* are pronounced with no ‘t’ at all, but rather as [hʌn̩]. Try and say it this way and see if it sounds like something you’ve heard before. In any case, while you may have initially transcribed the five words above with a /t/, they may also be transcribed in a way that reflects the different pronunciations of that sound, as in the following:

[tʰap] [stap] [lɪrl] [k^hɪʔn̩] [hʌn̩]

To a native speaker, all of the words above have a ‘t’ in them, at least at some psychological level. Proof of that lies in the fact that one may transcribe them all with a ‘t’, at least until trained in transcription. Someone who lacks linguistic training would probably not hesitate to state that all the above words have a ‘t’ and would need to be convinced that subtle differences, like aspiration, exist among them. In this sense, psychologically, the above words do have a ‘t’. On the other hand, we can observe that the ‘t’ may be pronounced in several different ways.

Unlike a speaker of English, a native speaker of Hindi could not ignore the difference between aspirated and unaspirated sounds when speaking or hearing Hindi. To a speaker of Hindi, the aspirated sound [p^h] is as different from unaspirated [p], as [p^h] is from [b] to our ears. The difference between aspirated and unaspirated stops must be noticed by Hindi speakers because their language contains many words that are pronounced in nearly the same way, except that one word will have an aspirated stop where the other has an unaspirated stop. The data in (1) illustrate this.

| (1) | Hindi | Gloss |
|-----|---------------------|------------|
| | [p ^h əl] | ‘fruit’ |
| | [pəl] | ‘moment’ |
| | [bal] | ‘strength’ |

A native speaker of English may not be aware of the difference between aspirated and unaspirated stops because aspiration will never make a difference in the meanings of English words. If we hear someone say [mæp] and [mæp^h], we may recognize them as different pronunciations of the same word *map*, but not as different words. Because of the different ways in which [p] and [p^h] affect meaning distinctions in English and Hindi, these sounds have different values in the phonological systems of the two languages. We say that these two sounds are **noncontrastive** in English, since interchanging the two does not result in a change of meaning. In Hindi, on the other hand, [p] and [p^h] are **contrastive**, since replacing one sound with the other in a word can change the word’s meaning. We will have more to say about this terminological distinction below.

Linguists attempt to characterize these different relations between sounds in language by grouping the sounds in a language’s sound inventory into classes. Each class contains all of the sounds that a native speaker considers as the “same” sound. For example, [t] and [t^h] in English would be members of the same class. But English [t^h] and [d] are members of different classes because they are contrastive. That is, if you interchange one for the other in a word, you can cause a change in the word’s meaning, e.g. [tʰaim] *time* vs. [daim] *dime*. On the other hand, speakers of Hindi would not classify [t] and [t^h] as members of the same class because they perceive them as different. That is, they are contrastive.

A class of speech sounds that are judged by a native speaker to be the same sound is

called a **phoneme**. Each member of a particular phoneme class is called an **allophone**, which corresponds to an actual phonetic segment produced by a speaker. That is, the various ways that a phoneme is pronounced are called allophones.

In this view, we can say that the ‘t’ sounds in words like *stop*, *top*, *little*, and *kitten* all belong to a single class, which we will label by the symbol /t/, characterizing this particular phoneme class. By saying that *stop* and *top*, for example, each have the phoneme /t/, we are saying that the sounds [t] and [tʰ] are related.

In (2) we see how the phoneme /t/ is related to its allophones in English and how the Hindi phonemes /t/ and /tʰ/ are related to their allophones. In English, [t], [tʰ], [ɾ], and [?] are allophones of the same phoneme, which we can label /t/. In this way, we can say that in English the phoneme /t/ has the allophones [t] as in [stap], [tʰ] as in [tʰap], [ɾ] as in [lrl], and [?] as in [ki?n]. On the other hand, in Hindi, [t] and [tʰ] are allophones of different phonemes. Note that symbols representing phonemes are written between slashes; this distinguishes them from symbols representing phones, which are written between square brackets.

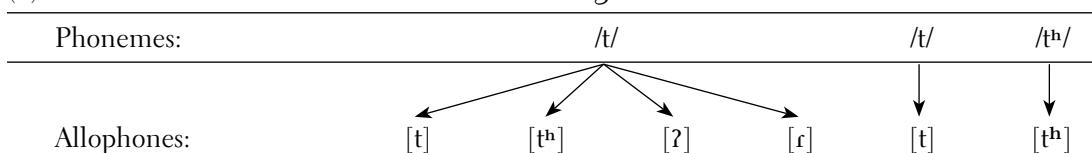
By providing a description like this, linguists attempt to show that the phonological system of a language has two levels. The more concrete level involves the physical reality of phonetic segments, the allophones, whereas phonemes are something more abstract. In fact, linguists sometimes describe phonemes as the form in which we store

sounds in our memory. So, phonemes are abstract psychological concepts, and they are not directly observable in a stream of speech; only the allophones of a phoneme are.

The phoneme is a unit of linguistic structure that is just as significant to the native speaker as the word or the sentence. Native speakers reveal their knowledge of phonemes in a number of ways. When an English speaker makes a slip of the tongue and says [tʃi kem] for *key chain*, reversing [tʃ] and [k], he or she has demonstrated that [tʃ] functions mentally as a single unit of sound, just as [k] does. Recall from File 3.3 that this is not the only way to conceptualize [tʃ]: it is phonetically complex, consisting of [t] followed immediately by [ʃ]. Yet, since [tʃ] represents the pronunciation of a single phoneme /tʃ/ in English, no native speaker would make an error that would involve splitting up its phonetic components; you will never hear [ti kṣen] as a slip of the tongue (see File 9.9).

Knowledge of phonemes is also revealed in alphabetic spelling systems. For example, English does not have separate letters for [pʰ] and [p]; they are both spelled with the letter *p*. Examples like this show that the English spelling system ignores the differences in pronunciation that don’t result in meaning distinctions. For the most part, the English spelling system attempts to provide symbols for phonemes, not phonetic segments. In general, alphabetic writing systems tend to be phonemic rather than phonetic, though they achieve this goal with varying degrees of success.

(2)



4.2.2 IDENTIFYING PHONEMES AND ALLOPHONES: THE DISTRIBUTION OF SPEECH SOUNDS

In order to determine whether sounds in a given language are allophones of a single phoneme or allophones of separate phonemes we need to consider the distribution of the sounds involved. The **distribution** of a phone is the set of phonetic environments in which it occurs. For example, nasalized vowels in English only occur in the environment of a nasal consonant. More precisely, a linguist would describe the distribution of English [i̯], [ø], and so on, by stating that the nasalized vowels occur immediately preceding a nasal consonant. In this section, we will mainly be concerned with two types of distribution: contrastive distribution and complementary distribution, though a third distribution, free variation, will also be introduced.

Let us consider **contrastive distribution** first. Recall from above that a pair of phones is contrastive if interchanging the two can change the meaning of a word. This means that the sounds can occur in the same phonetic environment. It also means that the sounds are allophones of different phonemes. Two sounds are noncontrastive if replacing one phone with another does not result in a change of meaning.

Our earlier discussion of the patterning of [p] and [p^h] in Hindi and English provides a good example of this difference. Recall that we said that in Hindi these two sounds could affect the meaning of a word based on examples like [pəl] *moment* and [p^həl] *fruit*, where the two meanings are distinguished by the occurrence of [p] or [p^h]. This means that the two sounds are contrastive in Hindi. In English, on the other hand, simply replacing [p] for [p^h], or vice versa, will never affect a change in the meaning of a word; the sounds are noncontrastive in English.

We just determined whether or not [p] or [p^h] are contrastive in Hindi and English by taking into account the distribution of sounds in each individual language. We did this by identifying a **minimal pair**. A minimal pair is defined as a pair of words with different meanings that are pronounced exactly the same way except for one sound that differs. When you find a minimal pair, you know that the two interchangeable sounds are contrastive and, thus, the sounds involved are allophones of different phonemes. If you try, you can think of many minimal pairs in English, or any other language you know well. For example, the minimal pair [tʰi:m] *team* and [tʰi:n] *teen* shows that [n] and [m] are allophones of separate phonemes in English since they can be used to contrast meaning. In Hindi, the words [pʰəl] ‘fruit’ and [bəl] ‘strength’ constitute a minimal pair, showing [p^h] and [b] to be allophones of separate phonemes; [p^həl] *fruit* and [pəl] *moment* also form a minimal pair in Hindi. But notice that there are no minimal pairs involving [p^h] and [p] in English; these two sounds are never contrastive with respect to one another. Instead, they are allophones of the same phoneme, /p/.

Consider another example in which two languages make different distinctions using the same set of sounds. In English, it is possible to find minimal pairs in which [l] and [r] are contrasted, e.g., *leaf* [lif] vs. *reef* [rif]; *lack* [læk] vs. *rack* [ræk]. However, [l] and [r] are never contrastive in Korean. Consider the data below ([i] represents a high central unrounded vowel).

| Korean | Gloss |
|---------|---------|
| [param] | ‘wind’ |
| [irim] | ‘name’ |
| [pal] | ‘foot’ |
| [mal] | ‘horse’ |

As these examples illustrate, minimal pairs can never be found for [r] and [l] in Korean

because these two sounds do not appear in the same positions in words: [r] appears only between two vowels, while [l] does not appear in this position. This observation about the distribution of [r] and [l] is not merely a property of these isolated examples but true of all Korean words containing these sounds. Observations of this sort play an important role in determining which sounds are considered to be the “same” by a native speaker; that is, sounds which are judged by a native speaker to be allophones of a single phoneme.

In addition to contrastive distribution, sounds may also be in **complementary distribution**. Sounds showing this type of distributional pattern are considered to be allophones of a single phoneme. To understand better what we mean by complementary distribution, think about what the term complementary means: two complementary parts of something make up a whole. For example, the set of people in your class at any given moment can be divided into the set of people who are wearing glasses and the set of people who are not. These two sets of people complement each other. They are mutually exclusive, but together they make up the whole class.

Now consider a linguistic example, namely, the distribution of the English sounds [p] and [p^h].

| | | | |
|--------------|--------|-------------|---------------------|
| <i>spat</i> | [spæt] | <i>pat</i> | [p ^h æt] |
| <i>spool</i> | [spul] | <i>pool</i> | [p ^h ul] |
| <i>speak</i> | [spik] | <i>peek</i> | [p ^h ik] |

As you can see in the English words just above, [p] and [p^h] do not occur in the same phonetic environment. As a result, there are no minimal pairs involving a [p]-[p^h] contrast. In fact, the phones are in complementary distribution: [p] occurs after [s] but never word-initially, while [p^h] occurs word-initially but never after [s]. Since these sounds appear in different phonetic environ-

ments there can be no pair of words composed of identical strings of sounds except for [p] in one and [p^h] in the other. As stated above, phones that are in complementary distribution are allophones of a single phoneme. In this case, [p] and [p^h] are both allophones of the phoneme we can represent as /p/. Furthermore, the appearance of one allophone or another in a given context is predictable. For example, we can predict that the allophone [p^h] (but never [p]) will appear in word-initial position. So even in words not listed above, we know that it will be [p^h], rather than [p], that will occur at the beginning of a word. Similarly, we can predict that [p] (but never [p^h]) will follow [s] in other words.

4.2.3 FREE VARIATION

In some phonetic contexts more than one pronunciation of a given sound may be possible. Consider, for example, the following words containing [p] and [p^v] ([p^v] represents an unreleased voiceless bilabial stop).

| | | | |
|--------------|--------|--------------|-----------------------|
| <i>leap</i> | [lip] | <i>leap</i> | [lip ^v] |
| <i>soap</i> | [sop] | <i>soap</i> | [sop ^v] |
| <i>troop</i> | [trup] | <i>troop</i> | [trup ^v] |
| <i>happy</i> | [hæpi] | — | *[hæp ^v i] |

It should be clear that these sounds both share some of the same phonetic environments; for example, they can both appear at the ends of words. Unlike the case of English [b] vs. [p^h], or [m] vs. [n], however, there are no minimal pairs involving these sounds in the language. And note that although there are pairs of words in the list above that differ in only one sound, none of these words contrast in meaning. Thus, the choice between [p] and [p^v] in *leap*, *soap*, and *troop* does not make a difference in meaning; that is, the sounds are noncontrastive. Rather, they are interchangeable in word-final position. Sounds with this type of patterning are

considered to be in **free variation**. To a native speaker, sounds like [p] and [p^t] that are in free variation are perceived as being the “same” sound. Thus, we can conclude that they are allophones of the same phoneme.

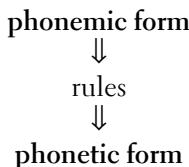
SUMMARY

To summarize, a phone’s distribution is the collection of phonetic environments in which the phone may appear; when linguists describe a phone’s distribution they describe this collection. Relative to each other, two (or more) phones will be in contrastive distribution, complementary distri-

bution, or in free variation. Phones in contrastive distribution may appear in minimal pairs and are allophones of different phonemes. Phones in free variation may also appear in the same phonetic environments but never cause a contrast in meaning; they are allophones of the same phoneme. In either of these two types of distribution, given a particular phonetic environment, one cannot predict which of the phones will occur. If the phones are in complementary distribution, their appearance in particular phonetic environments is predictable; they never appear in minimal pairs and they are allophones of the same phoneme.

File 4.3: Phonological Rules

In File 4.2, we discussed the fact that phonemes and (allo)phones belong to different levels of structure in language—that is, phonemes are mental entities and phones are physical events. In this file we consider the connection between these two levels. The mapping between phonemic and phonetic elements is accomplished using **phonological rules** (recall that a rule of grammar expresses a pattern in a language). A speaker’s knowledge of phonological rules allows him or her to “translate” phonemes into actual speech sounds; knowledge of these rules forms part of the speaker’s linguistic competence. This change from the phonemic underlying form to the actual phonetic form of a word by means of phonological rules can be represented with a diagram:



As an example, consider the English word *can* /kæn/. This word has a final /n/ sound in its phonemic form, and in fact it is frequently pronounced with a final [n]. If we listen carefully, however, we find that the final consonant of *can* (especially in casual speech) is often [m] or [ŋ]. The following examples illustrate this. (Here and throughout this file we use a fairly broad transcription

style, recording phonetic detail only for the segments under discussion.)

| | | |
|-------------------|---------------|-----------------------|
| <i>I can ask</i> | [aɪ kæn æsk] | (or [aɪ kŋ̩ æsk]) |
| <i>I can see</i> | [aɪ kæn si] | (or [aɪ kŋ̩ si]) |
| <i>I can bake</i> | [aɪ kæm beɪk] | (or [aɪ kŋ̩ m̩ beɪk]) |
| <i>I can play</i> | [aɪ kæm pleɪ] | (or [aɪ kŋ̩ m̩ pler]) |
| <i>I can go</i> | [aɪ kæŋ̩ goʊ] | (or [aɪ kŋ̩ goʊ]) |
| <i>I can come</i> | [aɪ kæŋ̩ kʌm] | (or [aɪ kŋ̩ kʌm]) |

As these transcriptions show, /n/ is pronounced as [m] when it precedes a labial consonant and as [ŋ̩] when it precedes a velar consonant. We can state this fact about English as a descriptive rule:

/n/ is pronounced as [m] before a labial consonant
[ŋ̩] before a velar consonant
[n] everywhere else.

(We will be adjusting this rule later on in this file.) Notice that a phonological rule has three parts: the sound(s) affected by the rule, the environment where the rule applies, and the result of the rule. Here /n/ is affected by the rule. The rule applies when /n/ is followed by a labial or velar consonant. The result of the application of the rule is that /n/ acquires the same place of articulation as the following consonant.

Now consider how the phonetic forms of some of the above examples are derived from the phonemic forms:

| | | |
|-----------------------|-----------|------------|
| phonemic form: | /kæn æsk/ | /kæn beɪk/ |
| apply rule: | kæn æsk | kæm beɪk |
| phonetic form: | [kæn æsk] | [kæm beɪk] |

This illustrates what happens in speaking. In listening, a hearer reverses this process: he or she perceives the phonetic form of an utterance, then sends it “backwards” through the phonological rules, finally obtaining a phonemic form that matches a form stored in memory.

The rule illustrated above applies not only to /n/, but also to /t/ and /d/:

| | |
|--------------------|---------------|
| <i>hat trick</i> | [hæt trɪk] |
| <i>hit batsman</i> | [hɪt bætsmən] |
| <i>night class</i> | [naɪt klæs] |
| <i>bad dream</i> | [bæd drɪm] |
| <i>head band</i> | [heb bænd] |
| <i>bad guy</i> | [bæg gaɪ] |

4.3.1 NATURAL CLASSES

Can we make one rule to state that /n/, /t/, and /d/ change place of articulation according to what sound follows? Is it random chance that these three sounds all seem to undergo the same phonological rule? To answer these questions, let’s first take a look at the articulatory descriptions of these three sounds:

| | |
|-----|------------------------------|
| /t/ | voiceless alveolar oral stop |
| /d/ | voiced alveolar oral stop |
| /n/ | voiced alveolar nasal stop |

Not only are all three sounds alveolar stops, but they are the *only* alveolar stops in English. The description “voiceless alveolar oral stop” can only mean /t/. We can make the description more general by removing some of the properties:

| | |
|---------------|---------------|
| /n/, /t/, /d/ | alveolar stop |
|---------------|---------------|

With respect to English, saying “alveolar stop” is the same as saying /n/, /t/, and /d/. These three sounds are all of the phonemes

| |
|------------|
| /kæn goʊ/ |
| kæŋ̩ goʊ |
| [kæŋ̩ goʊ] |

in English that are produced by stopping the flow of air at the alveolar ridge. Thus, they are the **natural class** of alveolar stops. A natural class is a group of sounds in a language that share one or more articulatory or auditory property, *to the exclusion of all other sounds in that language*. That is, in order for a group of sounds to be a natural class, it must include all of the sounds that share a particular property or set of properties, and not include any sounds that don’t.

4.3.2 PROPERTIES USED TO DESCRIBE NATURAL CLASSES

All of the properties used in Files 3.3 and 3.4 to describe individual sounds can also be used to describe natural classes. For example, in the English vowels the monophthongs [i, u] and the first part of the diphthongs [eɪ] and [oʊ] are tense vowels, and there are no other tense vowels in English. Thus, these vowels are members of the natural class of tense vowels in English. Likewise, the consonants [k, g, ŋ] are all described as velar consonants, and they are the only velar consonants used in English; thus they constitute the natural class of velar consonants in English. Notice that we already referred to the natural class of velar consonants in the formulation of our rule at the beginning of this file. You’ll recall that this rule affects the natural class of alveolar stops when followed by a member of either the natural class of velar consonants or the natural class of bilabial consonants. This shows that natural classes can be used to describe both the sounds affected by a rule *and* the environments where a rule applies.

In talking about groups of sounds, we must use a few properties in addition to those

needed to describe individual sounds. For example, if you look at the consonant chart in (5) in File 3.3 you will notice that the only labiodental consonants in English are the fricatives [f] and [v], while the bilabial fricative slots are left empty. In many situations it is advantageous to refer to [f] and [v] together with [p, b, m, w] and [w̯] as belonging to the same natural class. For this purpose we use the property *labial*.

Another property used to describe natural classes divides consonants into two groups, **obstruents** and **sonorants**. Obstruents are produced with an obstruction of the airflow. The sounds in this category are stops, fricatives, and affricates. Sonorants, on the other hand, are consonants produced with a relatively open passage for the airflow. Sonorant consonants include nasals, liquids, and glides. Thus, the class of labial obstruents in English is [p, f, b, v], while the class of labial sonorants is [m, w, w̯]. The class of labial consonants is the union of both sets: [p, f, b, v, m, w, w̯]. As we will see, being able to divide consonants into obstruents and sonorants is quite useful in stating phonological rules.

4.3.3 CLASSIFICATION OF PHONOLOGICAL RULES

In addition to grouping sounds into natural classes, we can classify phonological rules according to the kind of process that they involve. Seven major kinds of processes are discussed here, along with examples from the phonology of English and other languages.

a. Assimilation

Rules of **assimilation** cause a sound to become more like a neighboring sound with respect to some phonetic property. In other words, the segment affected by the rule assimilates or takes on a property from a nearby

(usually adjacent) sound. Rules of assimilation are very common in languages. The first rule we considered in this file falls into this category. We can call it alveolar stop assimilation because it applies to all alveolar stops (/t/, /d/, and /n/):

Alveolar stop assimilation (English):
Alveolar stops assimilate to the place of articulation of a following consonant.

Thus, when a sound having the properties alveolar and stop immediately precedes a labial consonant, this rule causes it to take on the property labial (thereby replacing its specification for alveolar). Similarly, this rule can apply to change the sound's place of articulation feature to dental when it precedes a dental consonant (examples such as *width* [wɪðθ] and *in this* [ɪn ðɪs]), and so on for the other places of articulation.

Another common assimilation process is **palatalization**. Palatalization refers to a special type of assimilation in which a consonant becomes like a neighboring sound. For example, when American English speakers say *Did you eat?* rapidly, they very often pronounce it as [didʒə it]. The sound [d] has been turned into a palatal sound [dʒ] because of the influence of the following palatal glide [j]. Vowels such as [i] and [e] also cause this change. The most common types of palatalization occur when alveolar, dental, and velar stops or fricatives appear before a front vowel. So the following are all common types of palatalization: [t] → [tʃ]; [d] → [dʒ]; [s] → [ʃ]; [k] → [tʃ]; [g] → [dʒ]. While there are variants on palatalization and other sounds can be palatalized, the main things to look for are (1) a sound becoming a palatal and/or (2) a sound change conditioned by a front vowel.

The rules of assimilation that we've discussed so far cause sounds to assimilate to *adjacent* sounds. This is a common way that assimilation occurs. However, long-distance

(1) The major natural classes of English consonants

| | Place of Articulation | | | | | | |
|-----------|-----------------------|--------------|--------------|----------------|---------|-------|---------|
| | Bilabial | Labio-dental | Inter-dental | Alveolar | Palatal | Velar | Glottal |
| Stop | | | | t | | | ? |
| Fricative | | θ | | | | | h |
| Affricate | | | | | | | |
| Nasal | | | | n | | | ŋ |
| Lateral | | | | l | | | |
| Liquid | | | | r ¹ | | | |
| Retroflex | | | | | | | |
| Liquid | | | | | | | |
| Glide | | | | | j | | |

Keys: Obstruents Sonorants

¹ See footnote 1 in File 3.2.

assimilation also exists, and a relatively common type of long-distance assimilation is called **vowel harmony**. This typically causes all the vowels in a word to “harmonize” or agree in some property such as rounding or backness.

Finnish has a common type of vowel harmony rule, which can be stated as follows:

Vowel harmony (Finnish): A back vowel becomes front when preceded by a front vowel in the same word.

By this rule, Finnish words have, with few exceptions, either all front vowels or all back vowels, but not both in the same word. We can see the vowel harmony rule in action when a suffix is added to the end of a word. In this case, the suffix vowel changes to match the quality of vowels in the word. For example, the suffix meaning ‘in’ has the form [-ssa] when added to a word where the last vowel is back, as in [talo] ‘house’, [talossa] ‘in the house’. However, the suffix takes the form [-ssæ] when it attaches to a

word with a final front vowel, as in [metsæ] ‘forest’, [metsæssæ] ‘in the forest’. In cases like this, we can say that the vowel of the suffix harmonizes, or assimilates, to the preceding vowel.

b. Dissimilation

Unlike assimilation, which makes sounds more similar, rules of **dissimilation** cause two close or adjacent sounds to become less alike with respect to some property, by means of a change in one or both sounds. An example of dissimilation in Greek is the following:

Manner dissimilation (Greek): A stop becomes a fricative when followed by another stop.

For example, in fast speech especially, the form /epta/ ‘seven’ can be pronounced as [efta], and /ktizma/ ‘building’ can be pronounced as [xtizma] ([x] is a voiceless velar fricative).

c. Insertion

Phonological rules of **insertion** cause a segment not present at the phonemic level to be added to the phonetic form of a word. An example of this kind of rule from English is voiceless stop insertion:

Voiceless stop insertion (English): Between a nasal consonant and a voiceless fricative, a voiceless stop with the same place of articulation as the nasal is inserted.

Thus, for instance, the voiceless stop insertion rule may apply to the word *dance* /dæns/ → [dənts], *strength* /strenθ/ → [strenkθ], and *hamster* /hæmstə/ → [hæmpstə].

d. Deletion

Deletion rules eliminate a sound. Such rules apply more frequently to unstressed syllables and in casual speech. English examples include:

/h/-Deletion (English): /h/ may be deleted in unstressed syllables.

The /h/-deletion rule would apply to a sentence such as *He handed her his hat* /hi hændəd hɪ hɪz hæt/ to yield [hi hændəd tɪz hæt]. Deletion is common in fast speech because it saves time and articulatory effort. Sounds like [h] that are not very perceptible are often the “victims” of deletion because speakers can save time and effort by deleting them without sacrificing much information. That is, the listener may not be relying on these sounds in order to understand what the speaker is saying.

phonemic form:

CV Metathesis:

phonetic form:

/danat+kviali/

dantakviali

[dantakviali]

/ukar+ppalu/

ukrappalu

[ukrappalu]

e. Metathesis

Rules of **metathesis** change the order of sounds. In many instances, sounds metathesize in order to make words easier to pronounce or easier to understand. In Leti, an Austronesian language, consonants and vowels switch places when a word that ends in a consonant is combined with a word that starts with two consonants. The last two sounds in the first word trade places to avoid having three consonants in a row.

CV metathesis (Leti): When three consecutive consonants occur, the first consonant trades places with the preceding vowel.

By this rule, /danat + kviali/ ‘millipede’ undergoes metathesis to become [dantakviali], and /ukar + ppalu/ ‘index finger’ becomes [ukrappalu]. On the other hand, /ukar + lavan/ ‘thumb’ does not undergo metathesis because there are not three consecutive consonants.

f. Strengthening

Rules of **strengthening** (also called *fortition*) make sounds stronger. The rule of English aspiration, as stated below, provides an example:

Aspiration (English): Voiceless stops become aspirated when they occur at the beginning of a stressed syllable.

The pronunciation of *tap* /tæp/ as [tʰæp] and *cat* /kæt/ as [kʰæt] illustrate the application of the English aspiration rule. Aspirated stops are considered to be stronger sounds than unaspirated stops because the duration of voicelessness is much longer.

/ukar+lavan/

—

[ukarlavan]

g. Weakening

Rules of **weakening** (also called *lenition*) cause sounds to become weaker. The “flapping” rule of English is an example of weakening. [r] is considered to be a weaker sound than [t] or [d] because it is shorter and it obstructs air less.

Flapping (English): An alveolar oral stop is realized as [r] when it occurs after a stressed vowel and before an unstressed vowel.

The pronunciation of *writer* /raɪtə/ as [raɪrə] and *rider* /raɪdə/ as [raɪrə] are examples of the application of this rule. Note that voicing assimilation is involved in the change of /t/ to [r]: the /t/ takes on the “voicedness” of the vowels surrounding it.

4.3.4 MULTIPLE RULE APPLICATION

To this point we have seen examples where one phonological rule applies. In reality there is often more than one change that occurs between a given phonemic form and a phonetic output. To illustrate this let’s look at how plural nouns are formed in English. When you learned to write in English, you learned that the way to make a noun plural is to add an “s,” which is usually pronounced [z]. There are actually three different phonetic forms of the English plural marker: [s], [z], and [əz], seen in the words *cats* [kæts], *dogs* [dægz], and *foxes* [faksəz]. We need only one phonemic form for the plural marker if we use two rules to derive the phonetic forms.

| | | |
|------------------------------|---------|---------|
| phonemic form: | /kæt+z/ | /dæg+z/ |
| <i>schwa insertion:</i> | — | — |
| <i>voicing assimilation:</i> | kæts | — |
| phonetic form: | [kæts] | [dægz] |

Try to pronounce [kætz] or [dags] in which the voicing quality of the final two consonants differ. You will probably find that it is difficult to produce a consonant cluster if one consonant is voiced and the other is voiceless. It is for this reason that the plural marker changes its voicing specification to match the sound it follows. We will use /-z/ as the phonemic form of the English plural marker, but notice that it doesn’t matter whether we choose /-z/ or /-s/. It works out the same in the end.

Voicing assimilation (English): /-z/ takes on the voicing specification of the preceding sound.

Now we can account for the different endings for *dogs* and *cats*, but what about the plurals of words like *fox*, *ditch*, *bush*, *orange*, *rouge*, and *maze*? What these words have in common is that they end in sounds that have a high-pitched hissing sound quality. These sounds are called **sibilant** consonants. The English sibilants are [tʃ, ʃ, s, dʒ, ʒ, z]. Notice that the plural marker is also a sibilant. Because of the high-pitched hissing sound, it is very difficult to hear two sibilants that are next to each other. Try saying [fakss], [ditʃs], [brɪdʒz], etc., and you will get the idea. This is remedied by inserting a schwa between two sibilants.

Schwa insertion (English): Insert [ə] between two sibilants.

With these two rules, we can derive the plural for any English noun (except, of course, for special plurals like *oxen*, *octopi*, and *cherubim*).

| | |
|----------|-----------|
| /faks+z/ | /brɪdʒ+z/ |
| faksəz | brɪdʒəz |
| — | — |
| [faksəz] | [brɪdʒəz] |

4.3.5 OBLIGATORY AND OPTIONAL RULES

Notice that phonological rules may be **obligatory** or **optional**. Obligatory English rules include aspiration, vowel nasalization, vowel lengthening, and liquid and glide devoicing. Such a rule always applies in the speech of all speakers of a language or dialect having the rule, regardless of style or rate of speaking. The effects of obligatory rules are often very subtle and difficult to notice, but they are an important part of a native accent. For instance, it may be difficult to tell that a vowel is nasalized in English, but the application of vowel nasalization makes us sound like native speakers of English.

The existence of obligatory rules is what causes people to have foreign accents. It is easier to learn the rules of a new language than to “turn off” the obligatory rules of your native language. The very fact that we are often unaware of these rules causes us to apply them when they are not appropriate. When speakers of American English learn other languages, they often apply rules such as flapping and vowel reduction, even though the other language may not have these rules.

Optional phonological rules, on the other hand, may or may not apply in an individual’s speech. Optional rules are responsible for variation in speech; for example, we can pronounce /kæn bi/ *can be* as either [kæm bi] or [kæn bi], depending on whether Alveolar Stop Assimilation is applied or not. The use of optional rules depends in part on rate and style of speech.

4.3.6 CONCLUSION

In this file we have covered seven types of phonological rules: assimilation, dissimilation, insertion, deletion, metathesis, strengthening, and weakening. These phonological rules operate on natural classes of sounds. We have also shown that a natural class is a group of all the sounds in a language that share some articulatory or auditory property(s) to the exclusion of all other sounds in that language. To describe natural classes we have used the properties *consonant*, *vowel*, *labial*, *sibilant*, *obstruent*, and *sonorant*, as well as properties used to describe individual consonants and vowels.

American Sign Language: The Phonological Base

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ABSTRACT

This paper has the ambitious goal of outlining the phonological structures and processes we have analyzed in American Sign Language (ASL). In order to do this we have divided the paper into five parts. In section 1 we detail the types of sequential phenomena found in the production of individual signs, allowing us to argue that ASL signs are composed of sequences of phonological segments, just as are words in spoken languages. Section 2 provides the details of a segmental phonetic transcription system. Using the descriptions made available by the transcription system, Section 3 briefly discusses both paradigmatic and syntagmatic contrast in ASL signs. Section 4 deals with the various types of phonological processes at work in the language, processes remarkable in their similarity to phonological processes found in spoken languages. We conclude the paper with an overview of the major types of phonological effects of ASL's rich system of morphological processes.

We realize that the majority of readers will come to this paper with neither sign language proficiency nor a knowledge of sign language structure. As a result, many will encounter reference to ASL signs without knowing their form. Although we have been unable to illustrate all the examples, we hope we have provided sufficient illustrations to make the paper more accessible.

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1. SEQUENTIAL PHENOMENA IN SIGN FORMATION

1.1 Background

The fact that all spoken languages combine meaningless elements to form meaningful symbols is regarded as one of the defining features of human language. Stokoe (1960) demonstrated that ASL signs may also be viewed as compositional rather than holistic and thereby provided the first structural evidence that ASL should be regarded as a language rather than merely a gesture system. His pioneering work has had a profound effect on all subsequent research into ASL structure.

He proposed that a sign consists of three parts which combine simultaneously: the tab (location of the sign), the dez (hand-shape), and the sig (the movement). Influenced by the American structuralists, Stokoe referred to these three aspects of a sign as "cheremes." He regarded cheremes as meaningless elements which combined to form all the signs in the language, in a manner analogous to that of spoken language phonemes.

The Stokoe model has been adopted almost universally by sign language researchers. The most recent treatments of the model hold signs to be temporally unitary phenomena, composed of some number of simultaneously occurring gestural

primes. According to this view of sign structure, the entire set of gestures comprising a sign is seen to be analogous to the set of articulatory primes that comprise a single segment in spoken language (Studdert-Kennedy and Lane 1980; Klima and Bellugi 1979:85–194).

Differences among signs are described by the substitution of primes within the simultaneous bundle. Thus, the difference between the signs MOTHER (an Open “5” hand touches the chin twice with the thumb) and FATHER (an Open “5” hand touches the forehead twice with the thumb) is described as a difference in location in the bundles of otherwise identical primes. Analogously, the difference between [p] and [t] is commonly described as a difference in the place of articulation primes in bundles of otherwise identical primes. Because of this view, sign languages have been seen to be unusual in that meaning is attached to such simultaneous bundles rather than to sequences of such bundles as it is in spoken languages.

In this model of sign structure (as in the model of spoken language segment structure), however, the claim that signs are simultaneous bundles of primes is not a claim that there are no sequential events within signs. It is a claim that within signs sequential organization is phonologically unimportant. Thus, while Stokoe and more recent workers recognize sequence within signs, they typically hold it to be phonologically insignificant (Stokoe 1960, Battison 1978). This is similar to the recognition that the onset-closure sequence present in the stops [p] and [t] is phonologically insignificant.

Liddell (1984a) argues that an adequate description of many phenomena in ASL requires the recognition of sequences of primes, and demonstrates that such sequences are capable of signaling contrast among signs. Below we will describe several



Figure 1. UNDERSTAND

descriptively important sequences of primes, and then return to the issue of contrast.

1.2 Handshapes

A significant number of signs in the ASL lexicon are produced with changes in handshape. For example, UNDERSTAND begins with an S handshape but ends with a 1 handshape.

This handshape change is described by Stokoe et al. (1965) as a unitary movement they call an “opening movement” wherein a handshape changes from a “Closed” handshape to an “Open” handshape. Table 1 presents a sampling of signs which all begin

Table 1. Signs with Initial S Handshape
Changing to Second Shape

| Sign | Initial Handshape | Final Handshape |
|----------------|-------------------|-----------------|
| UNDERSTAND | S | 1 |
| THROW | S | H |
| TWELVE | S | V |
| SO-WHAT | S | O |
| FINGERSPELL-TO | S | 4 |
| GAMBLE | S | 5 |

with an S handshape, but end with different handshapes.

Many other sequences of two handshapes occur in ASL signs. A smaller number of signs are produced with a sequence of three handshapes. In **SHOCKED** the handshape sequence is S-C-S. In **THINK-SAME-THOUGHT** the sequence is S-1-S. In **GOVERNMENT** the sequence is 1-Bent 1-1.

1.3 Locations

It is quite common for the hand to move from one location to another location during the production of a single sign. Such relocations occur frequently in simple signs and are especially common in compound signs, almost all of which move from one location to another.

The sign **PARENTS** is such a compound sign, derived from the signs **MOTHER** and **FATHER**. It begins at the chin (the location of **MOTHER**) and then moves to the forehead (the location for **FATHER**). Table 2 lists several examples of signs in which the location of the hand changes.

Compounds are marked with a “(C).” Because Stokoe’s sign schema permits a sign to have only one location, his notations treat



Figure 2. **PARENTS**

relocations in simple signs as complexes of movements. Thus, for example, **NAVY** might be said to be located at the left side of the waist and then to move to the right and make contact. The actual location at the right side of the waist would not be specified. Compounds are treated as linked notations of two complete signs, each of which has its own location.

Numerous verbs in ASL are marked for subject and object agreement and typically move from one location to another. Table 3 shows the locations involved with two verbs

Table 2. Initial and Final Locations of Some Common Signs

| | Sign | Initial Location | Final Location |
|-----|-------------|--------------------|---------------------|
| | SANTA-CLAUS | chin | chest |
| | GOOD | chin | base hand |
| | NAVY | left side of waist | right side of waist |
| | KING | left side of chest | right side of waist |
| | INDIAN | nose | side of forehead |
| | AHEM | chin | chest |
| (C) | PARENTS | chin | forehead |
| (C) | SON | forehead | forearm |
| (C) | PALE | chest | face |
| (C) | BROTHER | forehead | base hand |
| (C) | PROMISE | chin | base hand |

Table 3. Initial and Final Locations for Two Agreement Verbs

| Verb | Subj. | Obj. | Initial Loc. | Final Loc. |
|------|---------------|---------------|--------------|------------|
| TELL | — | 1st person | chin | chest |
| TELL | — | 3rd person(a) | chin | place(a) |
| GIVE | 1st person | 3rd person(b) | chest | place(b) |
| GIVE | 3rd person(a) | 3rd person(b) | place(a) | place(b) |
| GIVE | 3rd person(b) | 1st person | place(b) | chest |

marked for agreement. TELL always begins in contact with the chin, and then moves to a location which reflects agreement with its object. GIVE agrees with both its subject and object. Its initial and final locations are determined by the subject and object agreement morphemes which are inserted into the verb stem. Subject and object marking is not capable of being represented in Stokoe's notation system. We will discuss this in more detail in section 1.6.

1.4 Movements

Stokoe's original observations demonstrated that some signs require movements to be carried out in sequence. He describes CHICAGO as being made with a rightward movement followed by a downward movement; WHEN with a circular movement followed by a contacting movement; YEAR with a circular

movement followed by a contacting movement; and ALSO with a contact movement followed by a rightward movement, then another contacting movement.

Supalla and Newport (1978) demonstrate that very finely detailed differences in movement could distinguish some nouns from related verbs. Whereas Stokoe et al. (1965) reports the existence of a single sign meaning both "sit" and "chair," Supalla and Newport claim that SIT and CHAIR are separate signs. They find that for more than 100 such noun-verb pairs, the pattern of movement of the noun differs in predictable ways from that of the verb. They distinguish these formal differences in terms of three "manners of movement." They describe the movement of the sign SIT as a single, unidirectional movement with a "hold manner" and that of CHAIR as a repeated, unidirectional movement with "restrained manner."



Figure 3a. WHEN

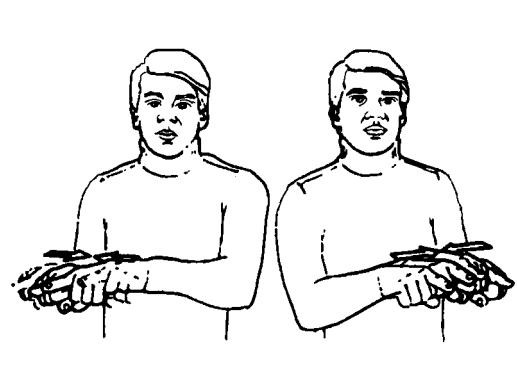


Figure 3b. ALSO

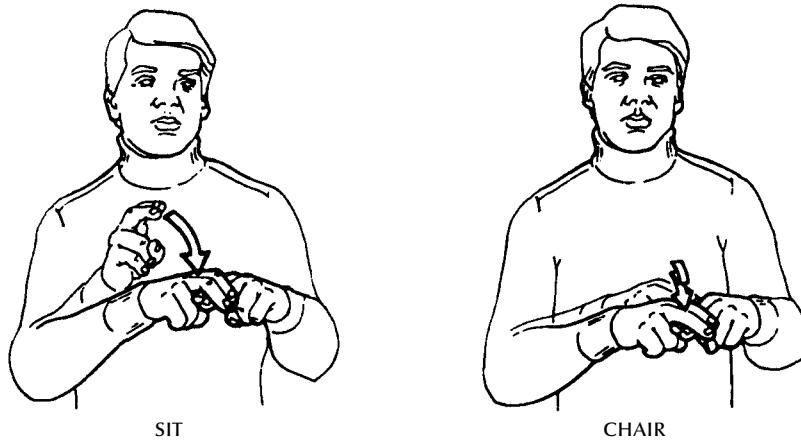


Figure 4. The movement differences between SIT and CHAIR.

Their manners of movement demonstrate a significant type of sequentiality in the formation of signs. The sign SIT begins with a motion toward the base hand and ends with the two hands in contact, but not moving. A sign ending with the hands immobile is said to have “hold manner” at the end of the sign. In their view such motionless periods are as important in providing contrast as are the periods of movement. They note (1978:96) that one of the possible implications of their findings is that signs may have sequential internal segments rather than a simultaneous bundle of features.¹

1.5 Local Movements

Local movements are small repeated movements of the fingers and wrist which accompany the major movements of the hand. For example, LONG-AGO is produced with a “5” hand configuration which moves backward to a hold at a point just over the shoulder. During the backward movement itself the fingers wiggle, but the final hold is produced without finger wiggling.

Thus LONG-AGO contains the sequence: local movement, no local movement. In

other signs, such as JUMP-FOR-JOY the wiggling is restricted to the middle of the sign where the active hand does not contact the base hand. This produces the sequence: no local movement, local movement, no local movement.

1.6 Nonmanual Signals

Many nonmanual signals involve no sequentiality. For example, the combination of raised eyebrows and backward head tilt which accompanies topics (Liddell, 1977) is



Figure 5. LONG-AGO

purely configurational, with no internal changes. Some nonmanual signals, however, are produced by sequencing nonmanual activities. Some such nonmanual signals occur as part of lexical items and others occur as part of morphological processes. A lexical item which requires a sequence of nonmanual activities is *GIVE-IN*. During the initial part of its production the lips are closed but during the final part of its production the lips are open. *ALL-GONE*, on the other hand, begins with the lips apart and the tongue slightly protruding and ends with the lips closed.

Sequences of nonmanual activities are also important as part of morphological processes. Liddell (1984b) describes a sequence of nonmanual activities required as part of the inflection for unrealized-inceptive aspect. When this inflection is applied to a verb, specific, predictable changes occur in both the manual and nonmanual portions of the sign. The sequence of nonmanual behaviors associated with this inflection require the signer to inhale through the mouth while rotating the trunk, and then to hold the resulting configuration during the final portion of the sign.

1.7 Contrast in ASL

We have illustrated several types of sequentiality in ASL signing, including sequences of handshapes, locations, nonmanual signals, local movements, and movements and holds. The simultaneous model of sign structure is not able to represent these sequential details in an effective way. This alone argues for a descriptive device which is able to represent important aspects of ASL sequence.

Specifically, given that signs have sequential structure, that sequence can be shown to correspond to phonological segments responsible for sequential contrast of the sort found in spoken languages. The

identification of physical sequence in the linguistic signal provides the evidence needed to argue that signs are composed of sequenced, abstract, linguistic segments. Support for the existence of such linguistic segments comes, in part, from a demonstration that ASL, like spoken languages, contains pairs of signs distinguished only by differences in sign-internal sequence.

It has become traditional in treatments of ASL structure to illustrate “minimal pairs” of signs as a demonstration of phonological contrast. However, because the simultaneous model of sign structure dictates that signs are composed of a single, simultaneous bundle of gestural features, such pairs of signs are able to demonstrate only simultaneous contrast of the sort found within segments in spoken languages. Thus, staying for the moment with the notion that signs are simultaneous, most “minimal pairs” of signs identified in the literature on ASL exhibit contrasts analogous to the differences between [p], [t], and [b]. They are distinctions of one feature within a single, co-occurrent bundle of features.

By contrast, in spoken language analysis, the notion of “minimal pair” has typically been used to demonstrate sequential contrast. Thus, a minimal pair is usually considered to be two words, contrastive in meaning, which are identical in all segments except one, in which they differ by only one feature. The kinds of ASL sequential details we have identified above provide this kind of evidence for sequential contrast.

THANK-YOU and *BULLSHIT* are minimal pairs in this sense. Both begin with identical holds produced at the chin and move to holds produced at a location about six inches out and slightly below the chin. In both signs, the orientation of the hand remains constant, with the palm toward the face and the wrist toward the ground. Thus, from the perspective of movement, location, and

Table 4. Sequential Contrast Between Minimal Pairs THANK-YOU and BULLSHIT.

| | THANK-YOU | | |
|--------------------|-------------------|--------------------|------------------|
| | <i>first part</i> | <i>middle part</i> | <i>last part</i> |
| movement | hold | move out | hold |
| location | chin | transitional | out from chin |
| orientation | palm to chin | transitional | palm to chin |
| hand configuration | B | transitional | B |
| | BULLSHIT | | |
| | <i>first part</i> | <i>middle part</i> | <i>last part</i> |
| movement | hold | move out | hold |
| location | chin | transitional | out from chin |
| orientation | palm to chin | transitional | palm to chin |
| hand configuration | B | transitional | S |

orientation the signs have identical sequences. They differ only in hand configuration sequence. Specifically, during the production of the sign THANK-YOU, the hand configuration begins and ends as a “B.” In the sign BULLSHIT, however, it begins as a “B” and ends as an “S.” In Table 4 the parts of THANK-YOU and BULLSHIT are aligned.

Although true minimal pairs such as these are not abundant in ASL, there are similar pairs that demonstrate sequential contrast in each of the major descriptive parameters of signs. Together they demonstrate that segments function to signal contrast in ASL in much the same manner as in spoken languages, and suggest that the description of segments is central to an adequate phonological analysis of ASL signs. In addition, the value of a segmental description in the analysis of the phonological and morphological processes of ASL will become more apparent as we proceed.

2. A PHONETIC TRANSCRIPTION SYSTEM FOR ASL

At first glance, it may seem inappropriate to use “phonology,” “phonetics,” and other

seemingly vocally-based terms in referring to details of sign language and its organization. As we mentioned earlier, Stokoe’s work explicitly avoids this difficulty by positing terminology such as “chereme” and “cherology,” which are specific to sign language. Battison (1974) demonstrates that sign language descriptions contain a sublexical level of analysis that appears in certain ways to be organizationally and functionally equivalent to the level of phonology in spoken languages. He argues convincingly that standard phonological terminology refers appropriately to those levels. A part of what we will be demonstrating in this paper is that an analysis of the patterns of organization of sign language signals yields levels of analysis quite similar to those known to exist in spoken language phonologies.

It is a matter of historical accident that, during the period of development of modern linguistic terminology, all languages known to linguists were spoken languages. Even so, for the most part, phonological terminology refers to the patterns of organization of linguistic signals, rather than to the signals themselves. Thus, the vocal reference of the *phone-* stem in words such as

phoneme is largely unnecessary. We use phonological terminology in referring to the organization of sign languages, with the understanding that the terminology here, as in studies of other languages, refers to general principles of organization probably found in all languages rather than to the specific vocal gestures of spoken languages.

2.1 Goals of Transcription

A transcription system for a language or set of languages should meet the dual goals of at once providing for the accurate representation of the detail of the “facts” of a language and assuring that those representations are useful in characterizing the organization of the facts.

We have attempted to devise a system that provides a linkage between the abstract and concrete aspects of phonological systems without committing overwhelmingly to either. Clearly, an adequate system of transcription must have elements of both. On the concrete end, a transcription must account for all the linguistically interesting details of the production of the signal. For our purposes, such phonetic transcription will be roughly equivalent in its concreteness to the “systematic phonetic representations” of standard generative phonology (Chomsky and Halle 1968). While such representations must account for a great deal of detail, they exclude (a) linguistically nondistinctive differences such as the difference between apical and laminal [s] in English; (b) sequential detail within phonologically functional units, e.g., elimination of onset and closure information from the description of English stop consonants; (c) detail stemming from universal physiological conditions; (d) detail stemming from individual physiological conditions, e.g., absolute voice pitch; and (e) traditionally nonlinguistic detail such as rate, loudness, and affect marking features.

On the abstract end, an adequate notation system must provide descriptive devices that permit a plausible linkage between the detailed surface representation and the underlying forms of the individual lexical items that are present in it. Thus, a single set of descriptive devices should at once be capable of characterizing each of the following: (a) the phonological shape (underlying form) of lexical items; (b) the phonological aspects of the morphology; (c) phonological processes; and (d) the surface forms of signs in running signed productions (at the level of concreteness specified above). To the extent that a system of notation succeeds in achieving this balance, it provides phonetic motivation for phonological features and phonetic plausibility for the abstract structures and processes of the phonological component.

That the system be usable is a second, more pragmatic goal which has influenced the current form of our notation system. Thus, while sign notations will ultimately be reducible to matrices of binary phonological features, most of the notations presented here contain taxonomic entries that represent bundles of such features. The use of such taxonomic entries is primarily a matter of clerical and typographical convenience, reducing the number of symbols required to transcribe a sign.

2.2 Overview of Sign Structure

2.2.1 Describing Segments. The segment is the central element in our view of the structure of signs. Thus, the representation of segments is the essential task of our notation system. In our system, each segment is represented individually and signs (and discourse strings) are represented as strings of segments.²

Segments in sign languages are composed of two major components. One

describes the *posture* of the hand; the other describes its *activity*. A description of the posture of the hand is concerned with where it is, how it is oriented, how its own movable parts are configured, and so on. The features that describe these details are collectively called *articulatory features*. We refer to the combination of articulatory features needed to specify a given posture of the hand as an “articulatory bundle.”

The articulatory bundle contains four major clusters of features. The first represents the *hand configuration*, i.e., the state of the fingers and thumb. The second cluster represents *point of contact*, which specifies the primary location with respect to which the hand is located, the part of the hand that points to or contacts that location, and the spatial relationship between that hand part and that location. The third cluster represents *facing*, which is composed of sets of features specifying a second location, and features indicating the part of the hand which faces that location. The fourth cluster of features in the articulatory bundle, *orientation*, contains features specifying a plane toward which a part of the hand faces. Orientation features distinguish THING (a sequence of movements made with the palm up) from CHILDREN (like THING but with the palm down). The four clusters, all taken together, describe the posture of the hand at a particular point in the production of a sign. They do not describe the activity of the hand.

The features that specify the activity of the hand during the production of the segment are grouped into a separate segmental feature bundle. They describe whether or not the hand is moving, and, if so, in what manner. The elemental work of this class of features is to distinguish movements from holds. *Movements* are defined as periods of time during which some aspect of the articulation is in transition. *Holds* are defined as

periods of time during which all aspects of the articulation bundle are in a steady state.

While the descriptive work of the segmental features is to detail the movement of the articulators, they function within signed strings to divide the flow of gestures into segments. By definition, then, the features that distinguish movements from holds also define the segmental structure of larger units such as signs, which we represent as strings of juxtaposed segments. This is not unlike the manner in which the major class features of generative phonology function. In spoken language phonology, major class features specify phonetic details of segments such as spontaneous voicing, interruption of the airstream, and syllacticity. These same feature values distinguish consonants from vowels and therefore also function to specify the manner in which the flow of speech is divided.

The remaining features in the segmental bundle specify the finer detail of segments such as contour of movement, simultaneous local movement of the fingers, and precise timing information such as length. We will discuss these features in detail below.

We have presented the articulatory bundles and segmental bundles separately, and in fact they function independently from each other in the specification of entire segments. The articulatory features combine to describe postural states. By definition, movement segments are those during which there is a change in state in some complex of articulatory features, and hold segments are those during which no such change occurs. Because they involve a steady state, a single matrix of features will be sufficient to describe holds. This matrix will contain both the segmental bundle of features including the specification of fine detail of the segment and the articulatory bundle of features describing the postural

state present during the production of the hold segment.

Movement segments, however, present another problem. During a movement the hand changes from one posture to another. Thus, because our articulatory features represent states, our system requires the specification of an initial and final bundle of articulatory features to indicate the changes during the production of the segment. Movement segments contain one bundle of segmental features containing the specification of the segment type and the fine details of the movement and two bundles of articulatory features, the first of which specifies the postural state at the inception of the movement and the second of which specifies the postural state of the hand at the conclusion of the movement. Hold segments contain one articulatory bundle; movement segments contain two articulatory bundles.

Both hold and movement segments may be represented by matrices of features, but following the discussion above the matrices will be different. The hold segment would correspond to be a straightforward and traditional feature matrix as in Figure 6, while the movement segment will have one set of segmental specifications and two sets of articulatory specifications, as in Figure 7.

An apparent alternative solution to the use of two kinds of matrices might be to use

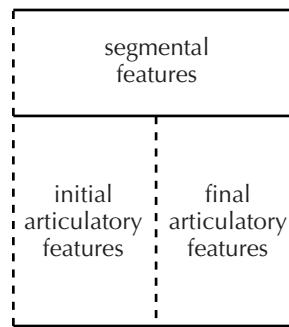


Figure 7. A movement matrix.

only hold matrices, let them define segmental structure, and have movement take place as a result of transitions from one state to the next. As we present more detailed descriptions of signs it will become apparent that independent movement features are necessary. This is because the fine details of movement production are features of the movement itself, not of either of the individual articulatory bundles. For example, when the hand moves on a path from one location to another, that path may take any of three contours. It may move in a straight line, on an arc, or on an indirect path with a sharp change of direction in the middle. These differences in path are contrastive and therefore must be recorded. They are not a feature of the initial articulatory posture nor of the final articulatory posture nor of both at once. They are a feature of the period of time during which the hand is changing from the initial posture to the final posture. Thus, they are details of the movement itself and must be specified independently of the articulatory information. Considerations presented below will confirm this claim of independence of the segmental and articulatory bundles of features.

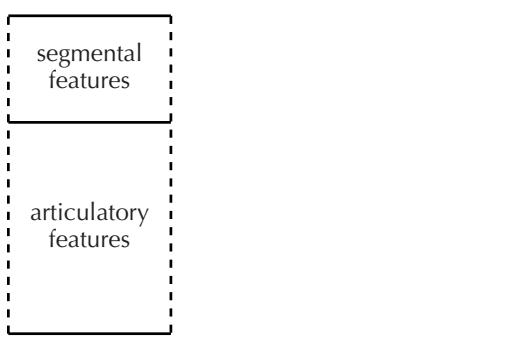


Figure 6. A hold matrix.

2.2.2 Non-Manual Behaviors. The segmental structure of signs also bears on the representation of the non-manual behaviors

that have linguistic function in ASL. At times, non-manual behaviors clearly have functions that are independent of the segment. Examples of such non-manual behaviors are those that have syntactic function and those that have clear morphological status. Others appear to be tied to specific segments within specific signs (Liddell 1984a). In both cases, although possibly independent in function, the behaviors are timed to the production of segments, and need to be specified in the transcription system. The exact nature of this specification will be taken up later.

2.2.3 Describing Sequences of Segments.

In the view of sign structure presented here, individual signs and larger constructions are all composed of sequences of segments. Thus, a sign or a piece of discourse may be represented as a sequence of hold and movement matrices, each composed of the appropriate number of segmental and articulatory bundles. The sign *GOOD*, for example, is composed of three segments: a hold, a movement, and a hold (see Figure 26b). The first hold occurs with the finger pads of a flat hand in contact with the chin. For convenience, we will call this complex of articulatory information “posture a.” From this hold, the hand moves outward and downward to a final hold, which occurs in space about a foot in front of the sternum with the same flat hand configuration oriented so that the palm of the hand is facing (roughly) upward and the tips of the fingers are pointing outward at about a forty-five degree angle. We can call this complex of articulatory information “posture b.” In our matrix format we can represent this sign as in Figure 8.

Notice that in the representation of *GOOD* the initial articulatory specification of the movement segment is the same as the articulatory specification of the first hold

| Hold | Movement | Hold |
|--------------|--------------|--------------|
| Posture a | Posture a | Posture b |
| | | Posture b |

Figure 8. Representation of feature matrix for sign *GOOD*.

segment. Similarly, the final articulatory specification of the movement segment is the same as the articulatory specification of the second hold segment. An initial posture of any segment in a string is identical to the final posture of the preceding segment. This is true by definition because a given line of transcription represents a sequence of behaviors of a single articulator, which can only start a gesture from the posture in which it terminated the preceding gesture. From this perspective it is unnecessary to record every articulatory bundle of information because (within signs) two articulatory bundles that share a common segmental boundary must be identical.

This observation stands as additional evidence for the independence of the articulatory features from the segmental features. It also recommends the use of an autosegmental representation which permits the attachment of single clusters of features of one sort to single clusters of features of another sort (Goldsmith 1976, McCarthy 1979), as in Figure 9.

Autosegmental representations of the sort presented in Figure 9, in addition to enhancing clerical economy, provide additional support for the earlier suggestion that the articulatory bundle of features is autonomous in function from the segmental

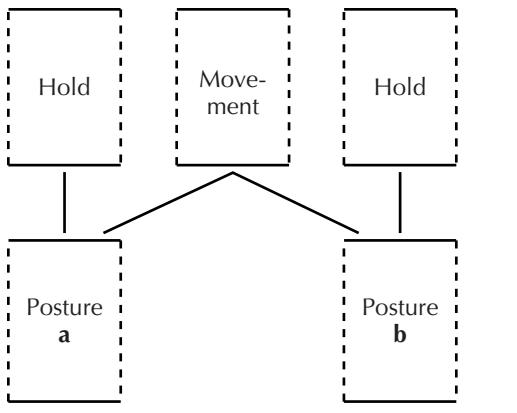


Figure 9. Representation of autosegmental attachment of feature bundles of the sign GOOD.

bundle of features. It is also quite likely that certain of the clusters of features within the articulatory bundle itself enjoy a similar kind of autonomy, particularly at the lower levels of the phonology where the independent postural and movement components must be finely timed to one another. Similarly, there may be more autonomous tiers of feature clusters at the level of the phonology that controls the production of fast speech, in which muscular activities and postures are reinterpreted and produced as perceptually and productively similar (though linguistically different) muscular behaviors. Autosegmental analyses of these phenomena may prove to be worthwhile. For our purposes, however, it is sufficient to use only the articulatory and segmental tiers, together with a tier for non-manual behaviors.

A number of the combinations of segments that may occur in ASL signs are presented in Figure 10.

2.2.4 Describing Signs Requiring Two Hands. As we indicated above, many signs make use of both hands as articulators. From a phonetic perspective, each hand is independent of the other. Moreover, the hands may carry different phonetic information at

a given moment. For example, one may be moving while the other is not. One may be in one location or orientation or hand configuration while the other hand is specified differently for one or more of these details. As one might expect, there appear to be fairly strong conditions on the nature and extent of the simultaneous articulation of two segments (Battison 1974, 1978), so the two hands are not completely independent phonologically. While a notation system may ultimately be able to eliminate certain aspects of the information that is predictable from such constraints on simultaneous articulations, it is useful at early stages of analysis to be able to represent each hand in its full phonetic configuration.

From the perspective of the segmental notation system described above, there is no difference between the productions of one hand and those of the other. Given this and their phonetic independence, each hand must be represented as a separate string of segmental notations, and the segments of one hand must be attached (for timing purposes) to the co-occurrent segments of the other hand.

The first difficulty encountered in the representation of the behaviors of both hands is that right and left are not absolute in signing. First, left-handed and right-handed signers sign mirror images of the same sign sequence with no change in meaning. A notation system should describe both the left-handed, left-dominant and the right-handed, right-dominant versions identically. Secondly, certain constructions treat spatial locations on the right and the left as absolute. A notation system must be able to distinguish right from left under these conditions. Third, certain constructions allow a signer to meaningfully alternate between right-dominant and left-dominant signing. The notation system must be able to describe this sort of alternation.

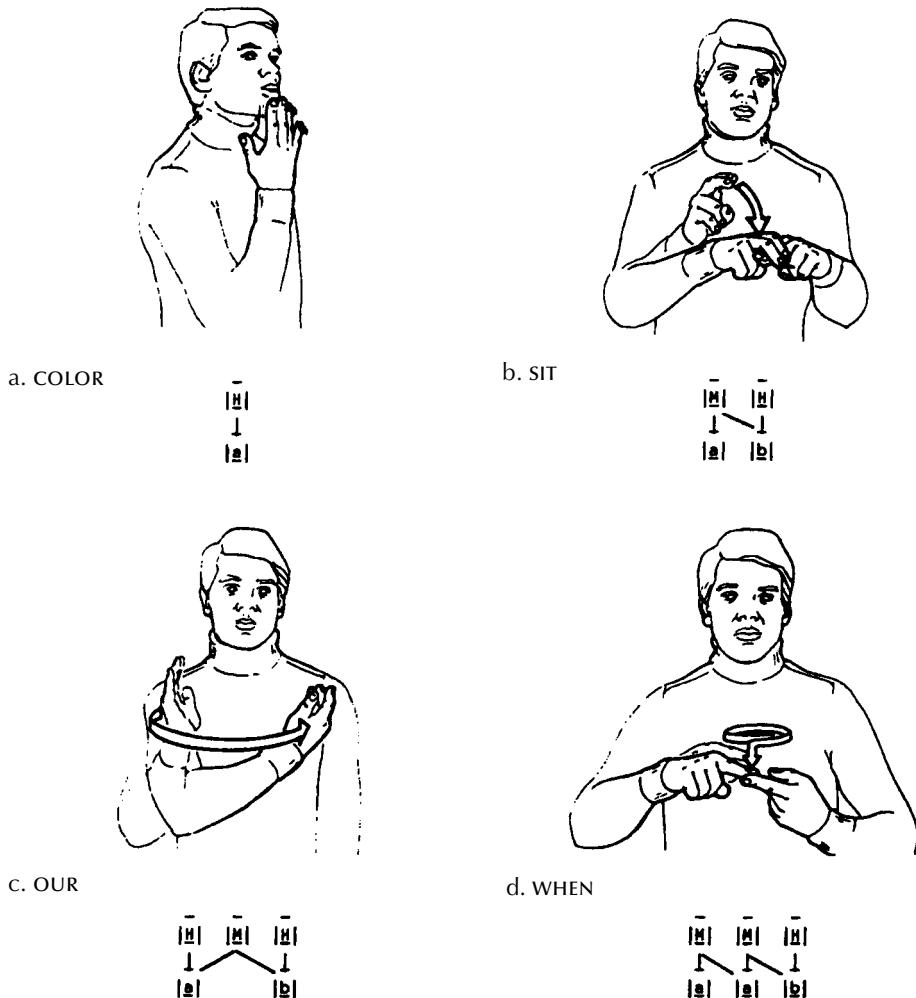


Figure 10. Signs illustrating common segment combinations.

Padden and Perlmutter (1984) introduce the terms “strong” and “weak” to describe the active hand and the hand it acts upon. Adopting those terms for our notation system will permit signs to be specified in a single way although signed in mirror image by right- and left-handed signers. We have chosen to use two vertically stacked strings of segments for two-handed signing. The top line represents the strong hand and the bottom line represents the weak hand. In such cases, the strong hand is understood to be the dominant hand of the signer. Particular

transcriptions of running sign will need to be marked for the dominance of the signer. When a signer shifts from expected-dominance signing to opposite-dominance signing the strong label will be shifted to the bottom line and the weak to the top line. In those instances when each hand is actually operating independently, the top line will be right for right-dominant signers or left for left-dominant signers.

It appears that the strong hand segments function as the central organizing elements for the timing of strings of co-occurrent

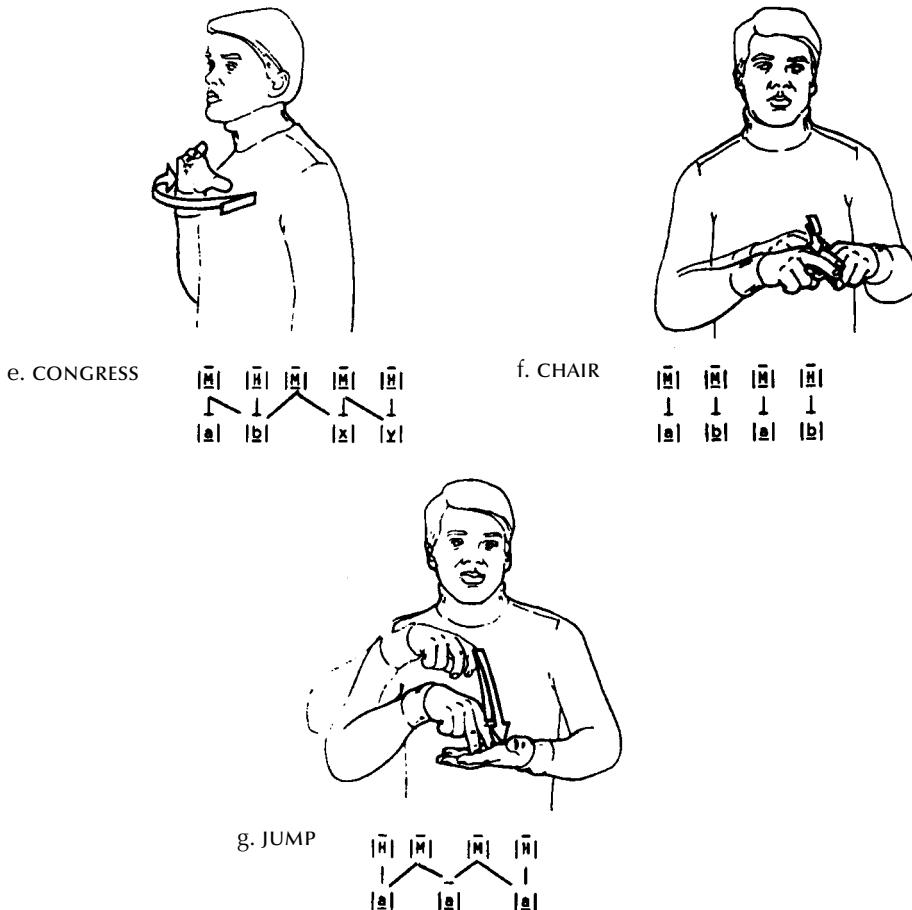


FIGURE 10 (continued). Signs illustrating common segment combinations.

segments. Therefore, the segments of the weak hand must be attached to those of the strong hand. Several combinations of strong and weak hands within signs and our conventions for attaching them are presented in Figures 11–13.

2.3 Detailed Description of Segmental Bundles

Segmental feature bundles specify the detail of movements and holds. Each such cluster defines one segment in the string of gestures in the transcription of a running signed production. Ultimately, the segmental bundle will contain numerous binary

features. At present it contains five slots for the entry of taxonomic symbols representing clusters of features. The five types of entries within the segmental bundle are laid out as shown in Figure 14.

2.3.1 Major Classes of Segments. There are two major classes of segments in ASL: holds and movements. As described above, a movement (M) segment is characterized by a change in one or more of its articulatory features and hold (H) segments are not. Notice that not all movement segments involve movement from one location to another. The change in articulatory specification may occur in the hand configuration



Figure 11. FIRED, a two-handed sign in which the strong hand moves with respect to the weak hand.

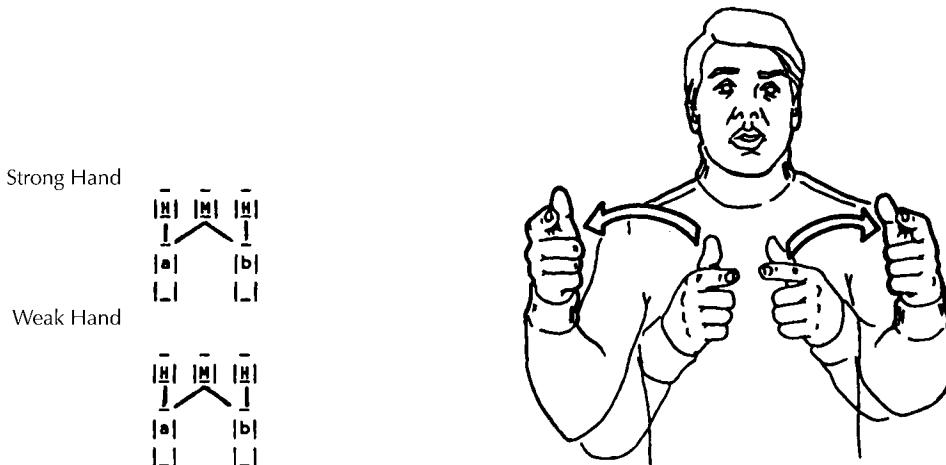


Figure 12. LARGE, a two-handed sign in which two hands move independently, simultaneously, and symmetrically.

(UNDERSTAND), the orientation (START), or other clusters of the specification. Such non-path movements do not appear to have a phonological status different from that of path movements (those in which there is a change in the point of contact specification) and so need not be distinguished by a special feature.

2.3.2 Contours of Movement. Those movement segments that move on a path be-

tween two locations may do so on one of several contours. *Straight* [str] movements traverse a direct, straight path between two points (GOOD). There are two types of indirect contour paths: *round* [rnd] and *seven* [7]. The seven contour describes an indirect path that is sharply angled (CHICAGO). The round contour describes an indirect path that is smooth. Arcs (OUR) and circles (FACE) both describe *round* paths but are distinguished by the fact that an arc begins at one

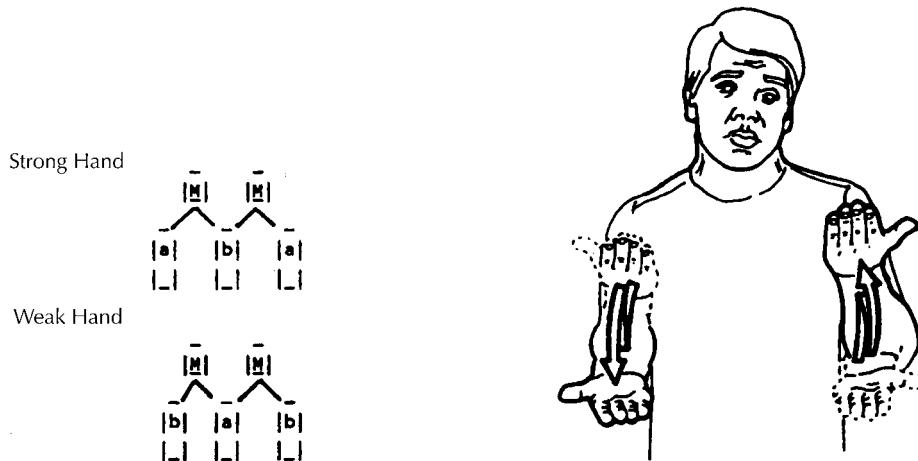


Figure 13. *MAYBE*, a two-handed sign in which the strong and weak hands perform independent movements but in temporal alternation.

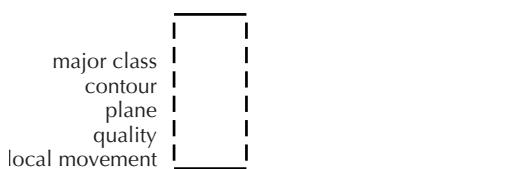


Figure 14. Organization of segmental features.

location and ends at another whereas a circle begins at a point, traverses a round path, and ends at its beginning point.

2.3.3 Contour Planes. When a path movement is not straight, it is necessary to specify an additional piece of information, which functions to orient the path. The entries indicate the plane upon which the hand travels as it moves between points. We currently record five planes. The *horizontal plane* [HP] is the plane parallel to the floor (OUR). The *vertical plane* [VP] is that plane parallel to the front of the torso (RAINBOW). The *surface plane* [SP] is the plane parallel to the surface at a location on the body or hand (FACE). The *midline plane* [MP] is a plane that intersects the surface plane along the midsaggital line of the body (BLOUSE, SIGN), or the plane through the long midline of the

bones of the arm or the hand (BASKET). We currently use the designation *oblique plane* [OP] to represent the plane that is horizontal from side to side but angled up and away from the body.

2.3.4 Quality Features. Quality features describe fine details of a segment. Among these are the temporal qualities *prolonged* [long], *shortened* [short], and *accelerating* [acc], and the nontemporal qualities *tense* [tns], *reduced path* [sm], and *enlarged path* [lg]. The quality feature *contacting* [contact] indicates that the hand makes contact with the other hand or a body location during the course of the movement. It describes brushing movements, in which the hand travels between points on two sides of a location, making brief contact with that location as it passes. It is also useful in describing the movement in which the hand moves to a location, makes brief contact, and rebounds to a point near that location.

2.3.5 Local Movements. The major classes of segments (H and M) reflect activity of the hand taken as a whole. It is common for signs simultaneously to exhibit movement

at the finger, wrist or elbow joints. Such movements are overlaid on the actual segmental activity, occurring together sometimes with H segments and sometimes with M segments. Thus, they are secondary, though linguistically significant activities. Each of the local movements is characterized by rapid, uncountable repetition. All may occur in H segments. At least wiggling, twisting, nodding, and hooking may occur in M segments.³

Wiggling [wg] represents repeated, sequentially alternating retraction at the first joint of all fingers extended at the first joint (COLOR). *Hooking* [hk] involves repeated, simultaneous retraction at the second and third joints of all fingers that are extended at the first joint and retracted at the second and third joints (“hooked” hand configurations) (WORM). *Flattening* [fl] is repeated, simultaneous retraction at the first joint of all fingers that are extended at the second and third joints and retracted at the first joint (“flat” hand configurations) (STICKY).⁴ *Twisting* [tw] describes repeated, alternating rotations of the wrist (WHERE). *Nodding* [nod] is a repeated retraction and extension of the wrist joint (YES).⁵ *Releasing* [rel] involves rapid, repeated opening of fingers that have thumb restraint (SHIRK-RESPONSIBILITY). *Rubbing* [rub] is repeated, back and forth rubbing of the thumb and the finger pads (DIRT). *circling* is a repeated, uncountable local circling about a central point simultaneously with either an H or M. It requires the specification of a plane.

2.4 Detailed Description of Articulatory Bundles

Each articulatory bundle is composed of eight entries, each representing a complex of features. The entries cluster into four possibly autonomous groupings, described above as hand configuration (HC), point of

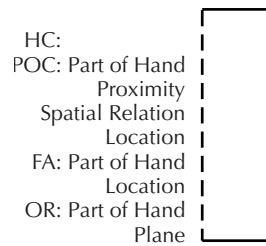


Figure 15. Organization of articulatory bundle.

contact (POC), facing (FA), and orientation (OR). They are organized as shown in Figure 15.

2.4.1 Hand Configuration. We have found more than 150 HCs in ASL lexical signs. Many more occur in the surface forms of running sign. A system of thirteen mostly binary features will distinguish all HCs we know to exist in sign languages. The taxonomic symbols we use as HC entries in our notations are capable of describing all the HCs of ASL and many more. They translate to features in a very straightforward way.

The HC entry is organized according to the following schema (see Figure 16).

While most HC use only the hand, others use the entire hand and forearm as a unit (ALL-DAY). Following Stokoe (1960), the symbol indicates the presence of such forearm involvement in the HC. If / is absent, the HC is assumed to use only the hand itself.

The HC description we have developed differs from most other approaches in that it notes finger configuration and thumb configuration separately. The portion of the HC

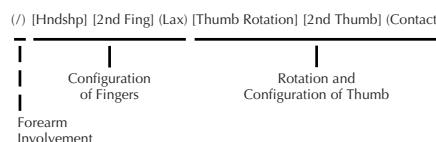


Figure 16. Organization of handshape features.

notation concerned with finger configuration contains slots for three symbols. The first is *handshape*, which indicates the state of extension and retraction of the four fingers. The symbols presented in Table 5 represent those combinations of open and closed fingers we know to occur in ASL signing.

Each of the four fingers is independently capable of being in one of four basic configurations: *open* (proximal joint (PJ) and distal joint (DJ) extended); *closed* (PJ and DJ flexed); *hooked* (PJ extended, DJ flexed); *flattened* (PJ flexed, DJ extended). The taxonomic symbols presented here function primarily to indicate which fingers are open and which are closed. The slot labeled [2nd Fing] in the schema contains diacritics for the hooking and flattening of those fingers ordinarily extended in a given handshape. Hooked is indicated by [“]; flattened is indicated by [^]. Thus, the symbol 1" indicates that the index is extended at the proximal joint and flexed at the distal joints and the symbol B^ indicates that all four fingers are flexed at the proximal joints and extended at the distal joints.

The diacritic for *lax* [~] indicates an additional modification to the finger configuration. It relaxes (slightly reverses) the prominent muscle action at both the proximal and distal joints. If the joint is extended lax will flex it slightly, although not enough to be fully flexed. Similarly, if the joint is flexed, lax will extend it slightly, although not enough to be perceived as fully extended. Thus, the effect of laxing is that the finger remains as specified but not rigidly so. Lax tends to affect all four fingers but has no effect on the configuration of the thumb.

All details of thumb configuration are specified in the final cluster of symbols. The primary value for the thumb is thumb rotation. The proximal joint of the thumb (near the wrist) is capable of rotating about ninety

Table 5. Symbols for Taxonomic Description of Major Finger Combination

| Symbol | Configuration |
|--------|--|
| A | Four fingers closed (pads contact palm) |
| S | Four fingers closed (tips contact palm) |
| 1 | All but index closed |
| ! | All but middle closed |
| I | All but pinky closed |
| Y | All but pinky closed; pinky spread |
| = | All but pinky and index closed; unspread |
| > | All but pinky and index closed; pinky and index spread |
| H | All but index and middle closed; unspread |
| V | All but index and middle closed; spread |
| K | Ring and pinky closed; index open; middle partly open |
| D | Index open; all others partly open |
| R | Ring and pinky closed; index and middle crossed |
| r | Ring and pinky closed; middle open; index partly open and crossed under middle |
| W | All but pinky open and unspread |
| 6 | All but pinky open and spread |
| 7 | All but ring open and spread |
| 8 | All but middle open and spread |
| F | All but index open and unspread |
| 9 | All but index open and spread |
| B | All four fingers open and unspread |
| 4 | All four fingers open and spread |
| T | All fingers closed; thumb under index |
| N | All fingers closed; thumb under middle |
| M | All fingers closed; thumb under ring |

degrees on its axis. When the thumb is relaxed and roughly adjacent to the plane created by the palm of the hand, it is in its *unopposed* [u] rotation. When the thumb is unopposed, its friction pad faces across the palm, and is capable of contacting the radial

side of the middle joint of any (flattened) finger or the radial side of the palm. Typically, if the thumb is touching the palm, it is in unopposed position.

The thumb may also be rotated so that its friction pad faces the palmar surface. This is its *opposed* [o] rotation, in which the tip of the thumb may easily contact the tip of any of the fingers. The opposed thumb typically cannot touch the palm of the hand except at the base of the little finger. It often contacts the fingers at the tip, pad, or nail, and if the fingers are closed may contact the back of the penultimate finger bones.

Both opposed and unopposed thumbs must also be specified for one of four values of secondary extension and flexion, indicated in the [2nd Thumb] slot. The proximal joint of the thumb is near the wrist and along with the two more distal joints operates to define the same four values of extension and flexion available to the fingers. Because the thumb features are descriptive rather than taxonomic, however, open and closed must be indicated. An *open* thumb is one in which the proximal and distal joints are both extended. Thus the symbol Bu will indicate a handshape with all fingers extended and unspread and a thumb that is on the plane created by the palm and extended at about ninety degrees outward from the radial side of the hand. The symbol Bo will designate the same finger configuration with the thumb extended at a ninety degree angle from the palmar surface. Leaving the PJ extended and flexing the DJ provides the *hooked* ["] thumb configuration. In *flat* [^] thumb configurations the PJ is flexed and the DJ is extended. In the [^] configuration the degree of flexion of the middle joint is typically adjusted to bring the thumb pad into contact with either a finger pad (for [o^] thumbs) or the middle joint of the first finger flexed at the PJ (for [u^] thumbs). When the [u^] thumb is not in contact with a finger it

is in pad contact with the radial side of the palm. The *closed* [-] configuration flexes both the PJ and the DJ. The symbol Bu indicates the B fingers with the thumb flexed and in contact with the palm. Ho- indicates a hand configuration in which the index and middle fingers are extended and the thumb is closed over the ring and little fingers.

In many hand configurations the thumb contacts one or more of the fingers. The specifications for this are the final entry in the hand configuration schema. There are four kinds of contact: *tip* contact [c]; thumb *pad* contact [p], in which the thumb pad contacts either the finger pad or the radial side of the finger; *finger restrained* contact [f], in which the thumb pad contacts the finger nail; and *thumb restraint* [t], in which the finger pad contacts the thumb nail. These symbols combine to describe every hand configuration we know to exist in ASL. A selection of them is presented in tabular form in Appendix A.

2.4.2 Point of Contact. The Point of Contact (POC) cluster contains slots for four symbols. These are: *location*, analogous in function to place of articulation in that it identifies a place on the passive articulator; *handpart*, the part of the hand that is located there; *proximity*, how near the handpart is to the location; and the *spatial relationship* between the handpart and the location.

Three different kinds of location specification may be entered in the location slot. Some signs are made with reference to a location on the body, some are made in the signing space surrounding the front of the head and torso, and some are made at a specific place on the weak hand.

Body Locations are those places where lexically distinctive signs may be made on the head, neck, torso, upper legs, or arms (exclusive of the hands). We have found that the accurate description of ASL requires

Table 6. The Twenty Major Body Locations

| | | | |
|----|------------------|----|-----------|
| BH | back of head | CN | chin |
| TH | top of head | NK | neck |
| FH | forehead | SH | shoulder |
| SF | side of forehead | ST | sternum |
| NS | nose | CH | chest |
| CK | cheek | TR | trunk |
| ER | ear | UA | upper arm |
| MO | mouth | FA | forearm |
| LP | lip | AB | abdomen |
| JW | jaw | LG | leg |

many more phonetically distinctive body locations than proposed in earlier treatments of sign notation. The entries describing body location are composed according to the following schema:

(%) (i) location (t or b)

The slot labeled location is filled by one of the twenty major body locations shown in Table 6.

Diacritic symbols may be added to each of the major body location descriptions in order to specify other locations near them. The diacritic [%] indicates that the location specified is on the side of the body contralateral to the signing hand. If this slot is empty the location is assumed to be ipsilateral.

Most of the major locations specified above are surrounded by a set of corresponding locations that may be described by adding two diacritics to the basic location symbol. The first is *ipsilateral* [i], indicating that the hand is at a location slightly toward the outside of the body from the major location. The second indicates a location in the *top* [t] portion or *bottom* [b] portion of the major location. Combining these entries provides the locations represented in Figures 17, 18, and 19. Appendix B presents examples of lexical signs made at each of the locations we know to be distinctive in ASL.

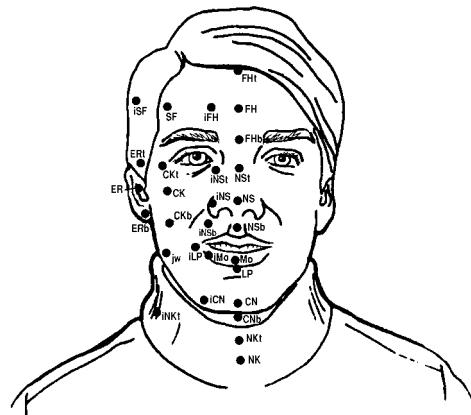


Figure 17. Articulatory locations on the head and neck.

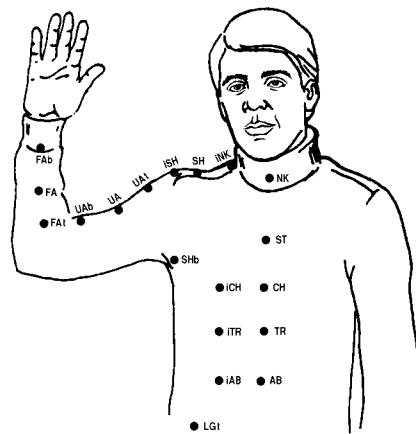


Figure 18. Articulatory locations on the torso.

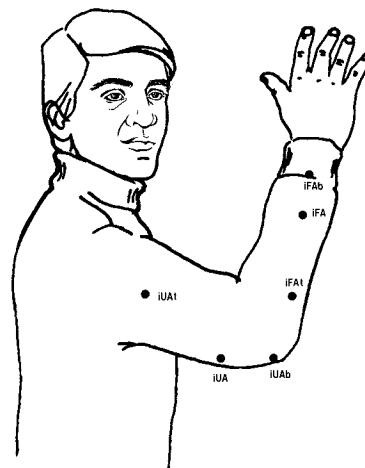


Figure 19. Articulatory locations on the arms.

Signs may also be produced at locations in the signing space surrounding the front of the body and head. Such *spatial locations* are described by a combination of a diacritic indicating a distance forward from the body on a perpendicular line, a symbol indicating the extent of ipsilateral offset from the midline, and the symbol for a major central body location:

Proximity—Ipsilateral Offset—Central Location

We currently distinguish four degrees of forward distance for spatial locations: *proximal* [p], indicating a location within a few inches of the body location; *medial* [m], a position roughly an elbow's length from the body location; *distal* [d], a comfortable arm's length from the body; and *extended* [e], a full arm's length from the body location.

The side-to-side dimension appears to require two degrees of ipsilateral offset. The first of these is roughly in line with the breast and the second is roughly in line with the outside edge of the shoulder. In order to avoid confusion with the set of finer distinctions among ipsilateral offset for the body locations, we refer to the degrees of ipsilateral offset for spatial signs with the numbers [0] (no offset), [1], and [2], respectively.

The last symbol indicates the height of the spatial location. It is chosen from among the major body location symbols that refer to points along the midline of the body (TH, FH, NS, MO, CN, NK, ST, CH, TR, AB). Thus, each spatial location is represented by a complex of three symbols. For example, the symbol m-0-TR describes a location about an elbow's length directly in front of the solar-plexus. The symbol m-1-TR indicates a location at the same height and distance forward, but on the breastline. Similarly, the symbol d-2-FH describes a location about an arm's length forward and a shoulder's width to the ipsilateral side of the center of the forehead. Appendix C presents selected signs produced at different spatial locations.

Most signs appear to locate on points like those described above. However, one important class of signs makes use of locations created by vectors radiating from midline locations. We have found use for seven such vectors. These vectors ([L3] [L2] [L1] [0] [R1] [R2] [R3]) and the locations they create around their intersection with the lines representing degrees of distance from the body are presented in Figure 20. One such semicircular system of locations may exist at each contrastive height along the

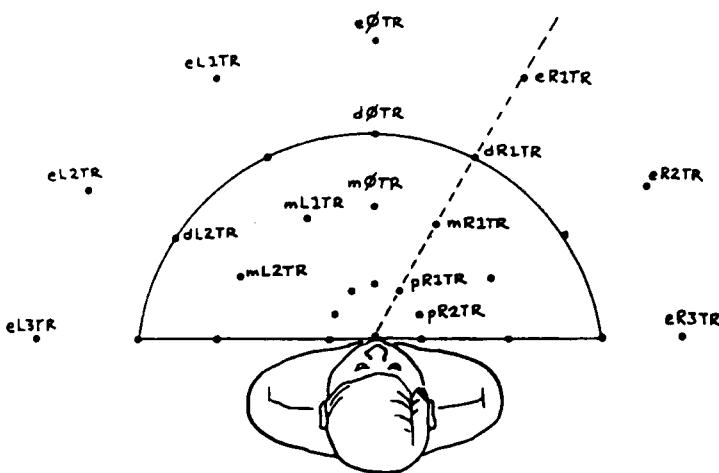


Figure 20. Spatial vectors used by agreement verbs.

midline. The vector specification substitutes in the spatial location schema for the ipsilateral offset number.

Thus, m-R1-TR specifies a location at TR height, about an elbow's length out from the center line on an approximately thirty degree right vector. Although the addition of a second set of location specifications may appear to be excessive, the behavior of predicates inflected for subject and object agreement and the behavior of locative predicates require it. We will return to this issue in more detail below.

For many signs, the location of the strong hand is a point on the weak hand (*FIRED*). The schema describing *weak hand locations* is composed of two symbols: one indicating a major part of the hand (hand, fingers, forearm, thumb, etc.), and the other indicating a zone in that major hand part (inside, back, radial edge, etc.). The specifications for locations on the weak hand and examples we have found in ASL appear in Appendix D.

The *handpart* slot of the POC complex will contain a handpart specification constructed in the same way as those described above. Whereas the handpart specifications exemplified in Appendix D specify weak hand locations, the handpart slot proper indicates which part of the strong hand makes reference

to or contacts the location of the POC. An inventory of strong hand handparts we know to occur in ASL is presented in Appendix E. Combining handpart and location in POC, we would find that the first segment of the sign *GOOD*, for example, contacts the LP location with the fingerpads of the strong hand. The POC of this segment will contain PDFI in the handpart slot and LP in the location slot. In the final segment of the sign *STOP*, the handpart is UL and the location is PA.

The *proximity* slot of the POC cluster specifies whether the handpart is in *contact* [c] with the location or, if not in contact, then its distance from the location. It appears that three distance specifications (proximal [p], medial [m], and distal [d]) are sufficient.

The spatial relationship slot of the POC cluster describes the direction at which the handpart is offset from the location. In brushing signs the hand moves between points on two sides of a location, making brief contact as it passes the location. For example, in the sign *FALSE* the handpart is the RAFI of a 1o- (index extended) hand configuration. The location is NS, the tip of the nose. The hand begins at a point proximal and to the ipsilateral side of the nose and moves to point proximal and to the contralateral side of the nose, briefly contacting it as it passes (Figure 21).

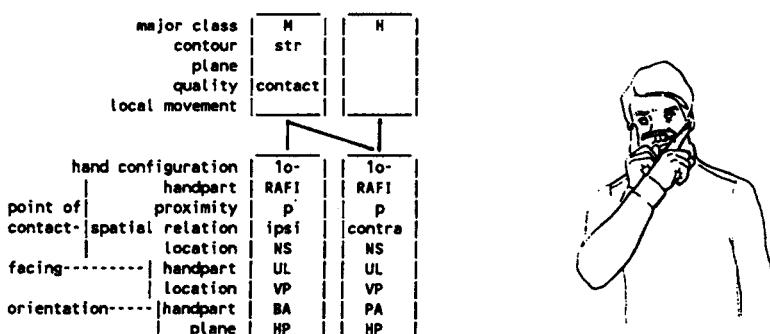


Figure 21. FALSE

We use two sets of spatial relationship symbols. One set refers to locations on the body or in space and the other set refers to locations on the weak hand. Those for body and spatial locations are the absolute directions over, under, behind (toward body from spatial location), ahead, contra, and ipsi. Because the weak hand can move, the spatial relations specified with respect to weak hand locations are relative to parts of the hand. The set includes: tipward [toti], baseward [toba], toward ulnar side [toul], toward radial side [tora], palmward [topa], and backward [tobk]. An articulatory bundle specified c in the proximity slot may be left unspecified in the spatial relation slot.

2.4.3 Describing Hand Orientation. The POC entries in the notation simply place a part of the hand at a location. At any location it is possible for the hand to assume countless orientations. The orientation of the hand is important in ASL signs, for both lexical contrast and morphological functioning. It appears that signs make use of two dimensions functioning together to orient the hand. The first of these is *facing*, which “points” a part of the hand at a location. The second is *orientation* proper which usually indicates which part of the hand is pointing toward the ground. The facing cluster is composed of two entries: one for a handpart and one for a location. The orientation cluster is also composed of two entries: one for a handpart (other than that used in facing) and one for a plane (usually HP). The sign STARE exemplifies the interaction of facing and orientation. In citation form it is produced as a hold with the hand located near and in front of the shoulder, with a V^o-hand configuration. If the third person object is associated with the vector R1, the tips of the fingers point directly forward toward R1 and the base of the hand points toward the ground. If the object is associated with the vector L2, the hand re-

| STARE-R1 | | STARE-L2 | |
|----------|------------------|------------------|---|
| Maj Cl | H | H | H |
| HC | V ^o - | V ^o - | |
| HdPt | BK | | |
| Prox | P | | |
| Sp.Rel | | | |
| Loc | SH | SH | |
| HdPt | TIFI | TIFI | |
| Loc | mL2SH | mL2SH | |
| HdPt | BA | BA | |
| Plane | HP | HP | |

Figure 22. STARE: Two different third person objects

mains in front of the shoulder, and the base continues to point to the ground, but the tips point to the object agreement location, in this case mL2SH.⁶ Numerous object agreement inflections may be achieved by altering the facing complex of STARE, independently from POC and orientation.

3. MORPHEME STRUCTURE CONSTRAINTS

Upon recording a corpus of connected signs using the system described above, it becomes clear that certain phonetic details of the segmental strings are predictable. For example, some details of phonetic representations recur as consistent patterns in the lexicon. These may be stated as *morpheme structure constraints* (MSC) on the combinations of features and segments permissible in novel lexical forms.

Battison (1974, 1978) identifies several MSCs in ASL, based on the notations present in Stokoe et al. (1965). As a result, they are stated largely in terms of a simultaneous model of sign structure. Nonetheless, he identifies both simultaneous and sequential conditions on the structure of ASL signs. For

example, he observes that the hand configuration R may contact locations in only a relatively limited number of ways (1978:38). This observation can be restated explicitly as a segmental MSC: If the hand configuration of a segment is specified as Ro-, then the hand part specification in POC will be one of the following: TIFI (DONUT), PDFI (RESTAURANT), BAFI (CIGAR), BA (ROCKET).⁷ Segmental MSCs such as this will constrain the inventory of segments that may be utilized in forming novel morphemes.

Similarly, Battison noted that in signs in which the hand configuration changes, only a limited number of sequences occur. One such sequential MSC states that if two segments of a sign contain different hand configuration specifications and the final hand configuration is lo-, then the first hand configuration will be l"o-f (UNDERSTAND). Similar sequential constraints appear to pertain to the following final/initial pairs of hand configurations: Ho-/Ho"-f (BEAT), Vo-/Vo"-f (TWELVE). Such constraints describe the preferential structure of lexical items but do not operate as phonological processes across word boundaries. For example, in the clause EXTREMELY-FOND-OF ## NAME “I am extremely fond of that name,” the Ho-hand configuration of the final sign NAME does not predict a H"o-f hand configuration for the preceding sign. EXTREMELY-FOND-OF retains its So-hand configuration, resulting in the sequence So-Ho-. The sequence H"o-f Ho-would be ungrammatical for this clause. Many other constraints such as these appear to exist in the lexicon, and will ultimately describe the extensive harmonic sequencing observable in ASL signs.

Battison also identifies another, more unusual sort of MSC, which specifies co-occurrence relationships between the two hands (1974). Spoken languages have little need for specifying the possibilities of co-occurrence among the independent articu-

lators, although constraints on the feature [round] and constraints describing coarticulated implosives are probably similar in function. In ASL it is possible to have fully specified strong and weak hands performing identical activities (LARGE) or mirror image activities (MAYBE), or completely different activities (FIRED). Moreover, there are minimal contrasts among one-handed and two-handed signs (LIKE; INTERESTING), so the weak hand is not completely predictable, and must be specified. Battison’s Dominance Condition specifies rather rigid limitations on differences between the hands. He points out that if the two hands have different hand configurations then the hand configuration of the weak hand must be chosen from a very limited set of easily discriminable hand configurations, while the hand configuration of the strong hand is much less constrained. The refinement of MSCs of this type promises to be a rich area of research in the segmental phonology of ASL.

4. PHONOLOGICAL PROCESSES

The phonological strings contain still another sort of predictable detail, traceable to *phonological processes*, producing alternations among surface forms. These processes are typically described by a complex of phonological rules, each of which may alter some detail of the representation of a form or add nonlexical phonological information to a string. The combined action of these processes ultimately derives the surface representation of the string.

4.1 Movement Epenthesis

Phonological processes proper influence the phonetic shape of phonological strings. Many of the phonological processes known to occur in spoken languages appear also in ASL. The most easily described is a process which inserts a movement between concatenated

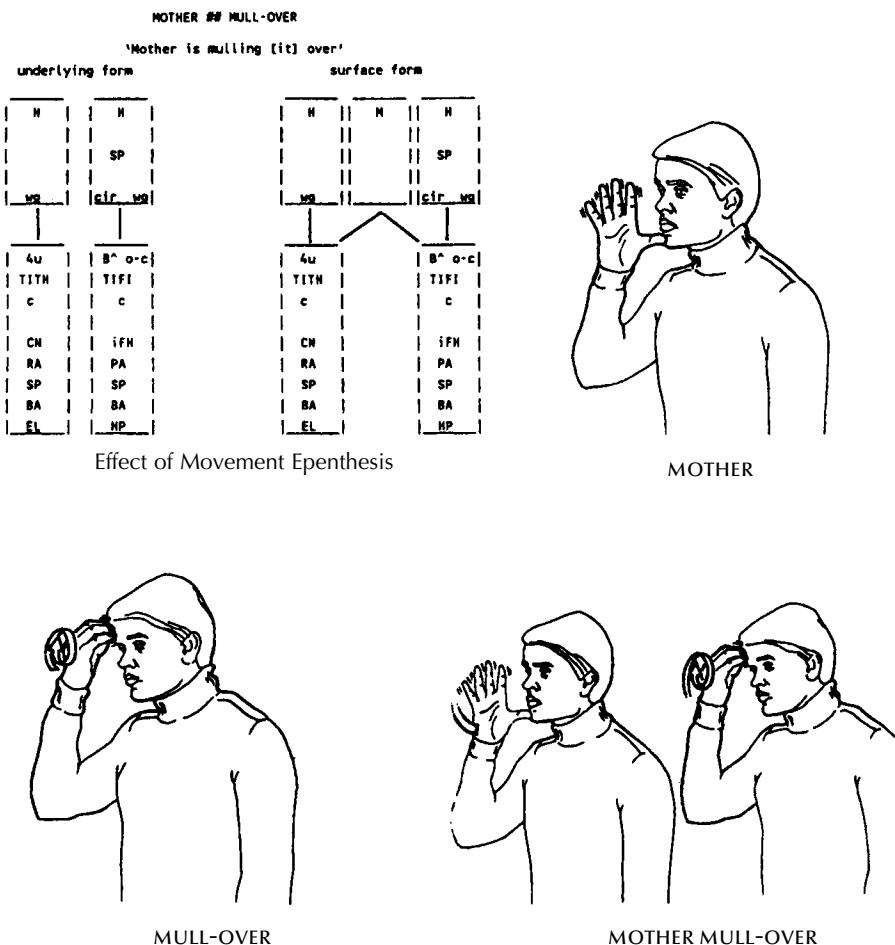


Figure 23. The effect of M Epenthesis in the string MOTHER MULL-OVER.

segments, the second of which begins with an initial articulatory bundle different from the final articulatory bundle of the preceding segment. For the most part, this process applies at the boundary between signs and enjoys the relatively straightforward function of moving the hand from the articulatory posture that ends one sign to the articulatory posture that begins the next. In the case of MOTHER MULL-OVER the Movement Epenthesis Rule inserts an M segment between the last segment of MOTHER and the first segment of MULL-OVER.

Although it may seem to be unnecessary to propose a rule describing a process so predictable, pervasive, and physiologically

motivated, the M segment introduced into strings by the M Epenthesis Rule functions as a critical part of the environment that feeds another phonological process.

4.2 Hold Deletion

That process is Hold Deletion, which, with certain exceptions, eliminates hold segments occurring between movement segments. The surface form of the phrase GOOD ## IDEA "good idea" demonstrates the application of the H Deletion Rule.

Because the sign GOOD ends with a segment articulated in a different way from the

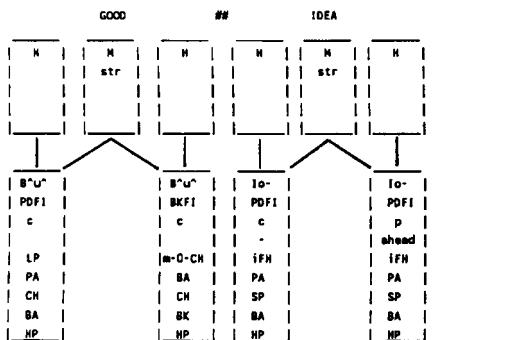


Figure 24. Underlying form of GOOD IDEA.

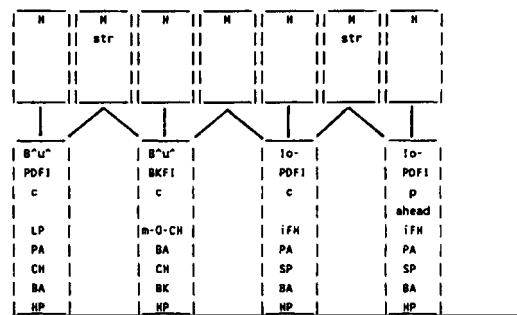
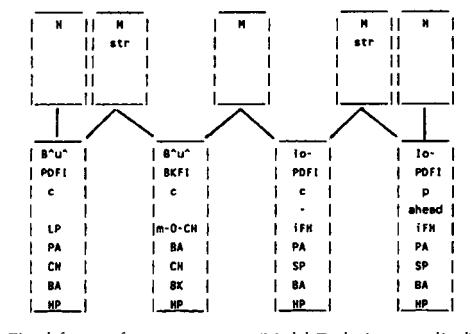


Figure 25. GOOD IDEA (Movement Epenthesis applied)



Final form of GOOD IDEA (Hold Deletion applied)



GOOD



IDEA



GOOD IDEA

Figure 26. The effect of M Epenthesis in the string GOOD IDEA.

initial segment of 'IDEA', the M Epenthesis Rule will insert a segmental bundle, specified as M, between the two signs. This has the effect of moving the hand from the area immediately in front of the chest to a location in contact with the side of the forehead

and simultaneously changing the other articulatory specifications from those describing an open hand oriented with its back to the HP to those of a hand with only the little finger extended and oriented with the tip of the little finger upward.

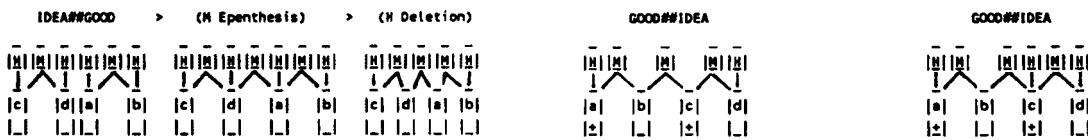


Figure 27. M Epenthesis and H Deletion.

Whereas the isolated signs GOOD and IDEA end and begin with substantial holds, when juxtaposed in this phrase the final H of GOOD and the initial H of IDEA are deleted. The critical environment for the application of this rule seems to be the M segments that surround each H segment.⁸

The surface form of the clause IDEA # # GOOD “The idea is good” is also affected by the H Deletion rule, which again causes only the inter-M holds to be deleted [Figure 27].

Certain conditions prohibit application of the H Deletion Rule. Holds that are lengthened, either by the presence of local movement or by morphological processes such as the one which produces a lengthened H at the beginning of emphatic forms, tend not to delete. Moreover, it appears that the application of H Deletion is variable by context. Although the extent and exact nature of the variation is not yet clear, it appears that H segments that do not contact the body or the other hand are generally deleted in inter-M contexts (as long as they are not lengthened), whereas those that do contact another body part are variably deleted. The following combinations result (+ indicates body contact) [Figure 28].

4.3 Metathesis

A number of signs exchange an initial sequence of segments with a sequence of final segments in certain contexts that appear to be purely phonological. The sign DEAF is typical of such metathesizing signs.

In this form of the sign the index finger first moves to contact the cheek and

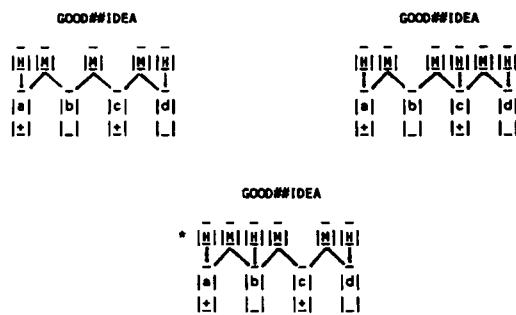


Figure 28. Possible and disallowed application of H Deletion.

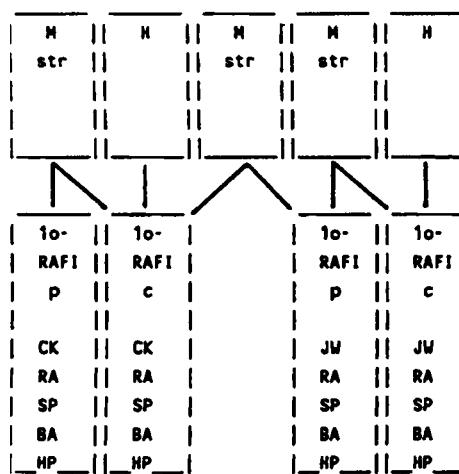


Figure 29a. DEAF



Figure 29b. DEAF

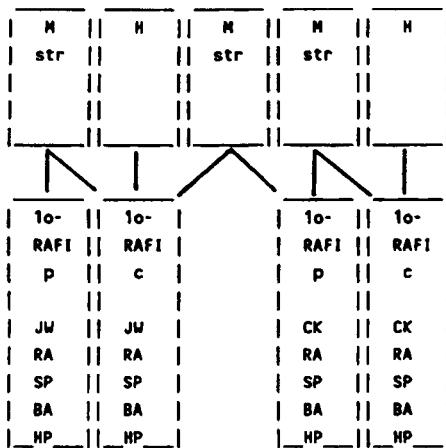


Figure 30a. DEAF (after metathesis).



Figure 30b. DEAF (after metathesis).

then moves to contact the jaw. This form of the sign typically occurs immediately following signs produced in the higher facial areas. Thus, it would be likely to occur in the clause FATHER ## DEAF "Father is deaf," since FATHER is produced with contact at iFH. However, if DEAF is immediately preceded by a sign in the lower facial regions (and perhaps other lower areas), the initial two segments are exchanged with the final two segments. In the clause MOTHER ## DEAF "Mother is deaf," the sign MOTHER produced at the chin causes DEAF to be produced as in Figure 30.

The sign WE further illuminates the metathesis process. There are two forms of WE; one has a segmental structure like that of DEAF, the other has an H M H sequence, with an arc M. WE₁ metathesizes but WE₂ does not (Figure 31).⁹

The signs CONGRESS, FLOWER, RESTAURANT, DEAF, HONEYMOON, NAVY, TWINS, BACHELOR, PARENTS, HOME, and HEAD have all been observed to undergo metathesis. All these signs have the same basic segmental structure as DEAF, i.e., a movement to a hold at one location followed by a movement to a hold at another location. Because no sign

with another segmental structure has been observed to metathesize, application of the phonological rule appears to require this underlying segmental structure. However not all signs with this underlying segmental structure may metathesize. BODY, KING, CHRIST, INDIAN, BLOUSE, THANKSGIVING, CHILDREN, and THING all have the appropriate segmental structure but may not metathesize. Most of these share the characteristic that their two contacts are in markedly different locations on the body. The last two do not make contact with the body. These tentatively appear to be additional phonological constraints on the application of the rule.

These observations carry two important implications for the general theory of the structure of signs we are proposing here. The first is that we have some justification for treating signs with this segmental structure as having two lexical parts. Specifically, we propose that the underlying form of such signs contains two unconnected M H sequences, which are subject to metathesis and which (whether or not metathesis has applied) are connected by the M Epenthesis Rule, as represented in Figure 32.¹⁰ Signs such as WE₂ have a unitary lexical form

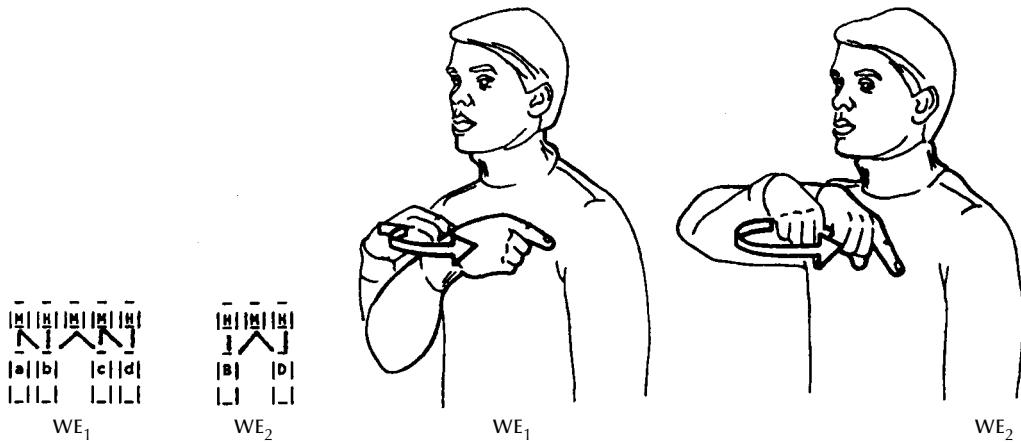


Figure 31. Alternate forms of WE.

H M H, which may not be permuted by metathesis and in which the segmental information in the M must be specified as an arc.

The second important implication of these observations suggests that a complete feature analysis of locations will provide insights into the nature of phonological processes. First it is probable that some feature or set of features unites the sets of locations between which metathesis may occur and distinguishes those which are saliently distant enough to prohibit metathesis. Moreover, the conditioning of the Metathesis Rule by prior signs will depend on a feature analysis that recognizes that certain locations are more to the left or right or below or above certain other locations. Only features that carry this sort of information may condition the appropriate application of the Metathesis Rule. Such featural information

will account for the fact that signs made on the stomach, the chest, or the chin may all provide the condition that selects initial occurrence of the lowermost sequence of DEAF.

4.4 Gemination

Although such occurrences are rather rare in ASL, it sometimes happens that the terminal segment of one sign is identical to the initial segment of the following sign. In the sentence,

SPAGHETTI_{3A'} MOTHER REPULSED-BY_{3A}
"Mother really hates spaghetti"

the final segment of MOTHER (the form of MOTHER without local movement) and the initial segment of REPULSED-BY are identical holds. The result is a single long hold. An epenthetic movement away from the chin or a hold of normal length is ungrammatical.

4.5 Assimilation

There are numerous instances of assimilation in ASL. For example, the hand configuration of the sign ME typically assimilates to that of a contiguous predicate in the same

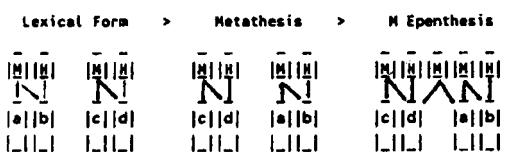


Figure 32. Relationship between metathesis and epenthesis.



Figure 33. Phonological assimilation of handshape features in the string ME GULP.

clause. Thus, whereas the underlying form of ME contains a 1o- hand configuration, in the string

MOTHER_{3A} STARE-AT, ME GULP.

"Mother was staring at me and I was nervous about what was to come"

ME assumes the 9o-c hand configuration of GULP. The extent to which signs other than ME assimilate to the hand configuration of another sign, although not yet thoroughly investigated, appears to be considerably more limited.

Assimilation of the hand configuration of the weak hand to that of the strong hand in two-handed signs is quite common. For most signers it appears to be variable, probably controlled by formality and fast-signing constraints. Thus, it is common that in signs in which the strong and weak hand configurations are different in formal signing, the weak hand configuration will be fully assimilated to the strong hand configuration in casual or fast signing.

We have observed numerous other examples of assimilation in ASL. Among these are the assimilation of orientation and fac-ing features of the weak hand to those of the strong hand; assimilation of features specify-

ing location in POC of an initial segment of one sign to the location features of the final segment of the preceding sign; assimilation of location features of the final segment of a sign to the location of the initial segment of a following sign; two-handed signs becom-ing one-handed as a result of assimilation to a one-handed sign in the same string; one-handed signs assimilating to two-handed signs. These processes await more detailed description.

4.6 Reduction

Frishberg (1975) notes a number of histori-cal trends in ASL which she identifies as "displacement." Each of these involves the diachronic relocation of certain signs to areas either less central to the face (and thereby less likely to obscure important fa-cial signals) or to areas more central to the lower head and upper body regions of the signing space (and thereby more readily perceptible).

Although such forms appear to be lex-i-calized at their new locations, the phono-logical processes that originally must have moved them are still active in contemporary ASL. The rules which account for them

appear to be variably selected by casual signing, and, like vowel reduction rules in spoken languages, have the effect of neutralizing contrasts of location. Thus, many signs that are produced with contact at the SFH location in formal signing may be produced in casual signing at the CK location. Similarly, signs produced at the CK location (including those moved from the SFH location) may be produced at the JW location. These same signs also appear at times without contact in the area immediately in front of the iNK location. The first segment of the sign KNOW-THE- is produced formally at the SFH location but may occur in casual signing at any of the other locations described above.

In a somewhat similar manner, signs produced at a location proximal to, but not in contact with FH or NS in citation form (KNOW-NOTHING, DOUBT) and signs produced with contact at the mouth (GLASS) may be produced at the CH location. Signs that do have underlying contact at the FH or NS locations are not subject to the effects of this rule (FATHER, BLIND). Similar rules exist to reduce peripheral locations on the torso to more centralized locations.

It appears also that there are rules that reduce the distance between the locations of two-location signs in casual signing. The M M M H sequence of the type isolated by the metathesis rule (CONGRESS, HOME) is commonly reduced by such a rule, and it appears that many other segment sequences also undergo a similar reduction process (GOOD, GIVE, etc.). Similarly, the size of the first (round) movement in M M H sequences such as YEAR, WHEN, POLITICS, and QUESTION is often reduced in casual signing.

4.7 Perseveration and Anticipation

Typically, signed strings contain both one-handed and two-handed signs. When a one-

handed sign follows a two-handed sign, although the weak hand is not required, in casual and fast signing it commonly either perseverates features of the former sign or anticipates features of the following sign, or both, rather than returning to a resting position. Although these processes and other very late phonological processes such as reduction have the relatively trivial phonological function of speeding and smoothing the phonetic string, they apply very broadly. Thus, because they apply to most forms produced in comfortable signing, these processes commonly have a substantial impact on the underlying form of lexicalized compounds and other lexical entries that result from the lexicalization of productively produced forms.

5. MORPHOLOGICAL PROCESSES

Another sort of predictable detail originates in the morphology, where *morphological processes* create words. Across languages, words are formed by attaching lexical forms to one another and by moving, reproducing, deleting from, adding to, and altering the phonological information carried by lexical forms. Although both morphological processes and phonological processes may add, delete, alter, or move phonological details, they differ in that phonological processes do not account for meaning changes whereas morphological processes do.

Below we will describe a small selection of ASL morphological processes that illustrate the diverse phonological effects which result from their application. We have divided these processes into two broad categories. In the first, meaningful feature bundles (morphemes) are inserted into one or more segments of a root with incomplete articulatory feature bundles. This insertion results in a phonologically fully specified stem. In the second major category, the

morphological processes operate on a completely formed stem either by removing some of its phonological features and inserting them in a segmental frame, by modifying them through reduplication, or, rarely, by attaching an affix.

5.1 Processes that Insert Features in Roots

For many ASL signs, we posit lexical forms of roots with empty spaces (or “cells”) in their underlying feature specifications. A number of ASL morphological processes “fill out” such incompletely specified roots with morphemes which consist of the small bits of phonological information used to fill

the empty cells in the root. The three signs in Figure 34 are representative of a large class of such signs, built from roots specified for all their features except hand configuration.

These three signs are identical except for their hand configuration. FIRST-PLACE is produced with a lo- hand configuration, SECOND-PLACE has a Vo- hand configuration, and THIRD-PLACE has a Vu hand configuration. Signs meaning FOURTH-PLACE through NINTH-PLACE can be formed by using other hand configurations. In numerous other signs the same hand configurations convey equivalent meanings of numerosity.

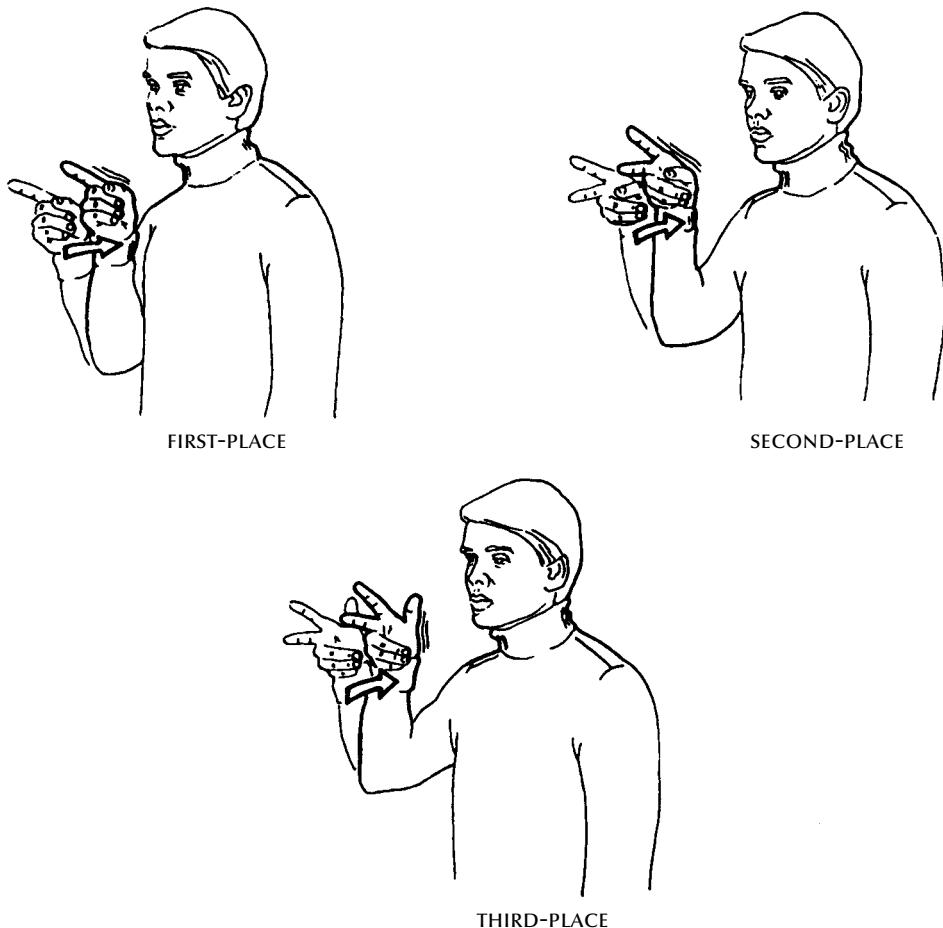


Figure 34. Substitutability of numeral morphemes into a phonologically incomplete root morpheme.

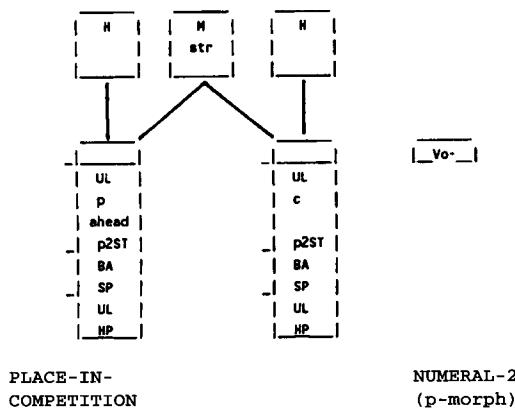


Figure 35. The two bound morphemes required for "first place," "second place," etc.

We contend that these signs (and others with numeral hand configurations) contain at least two morphemes: the root morpheme, a numeral classifier which means "place in a competition," and the numeral morpheme. The two morphemes in SECOND-PLACE and their phonological relationship to one another are sketched in Figure 35. The root, PLACE-IN-COMPETITION, is composed of three segments and two incompletely specified articulatory feature bundles. A numeral morpheme is required to complete the phonological representation of the stem SECOND-PLACE.

We refer to roots such as PLACE-IN-COMPETITION as "Incomplete S-morphs,"

since their phonological representation is segmental, but incomplete (Johnson and Liddell 1984). The numeral morpheme is referred to as a "P-morph" since it only provides paradigmatic contrast (i.e., it contains no segmental information). It can be inserted into a root consisting of one or more segments and its features simply spread according to autosegmental principles. We have identified more than thirty different incomplete S-morphs which, like PLACE-IN-COMPETITION, require the insertion of a numeral morpheme.¹¹

A second major category of incomplete S-morph contains verb roots with unspecified location information. The completed form of the verb stem of such signs contains location (vector) specifications received through the insertion of subject and/or object agreement morphemes. Two such verbs, ASK and TELL, are illustrated in Figure 36.

The initial location for TELL is the chin. Its final location, however, is determined by the insertion of an object agreement morpheme. In Figure 37, TELL agrees in location with the 3rd person object already indexed on the signer's left.¹² ASK is structured so as to allow both object agreement and subject agreement morphemes to be inserted.

The subject agreement morpheme pictured on the left in Figure 38 is determined by the person and location of the subject

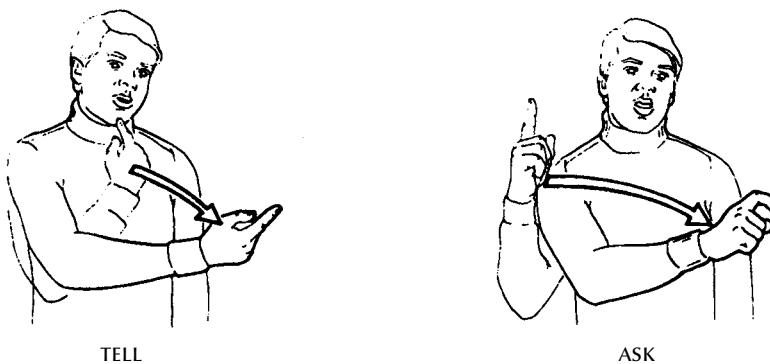


Figure 36. An object agreement verb (TELL) and a subject-object agreement verb (ASK).

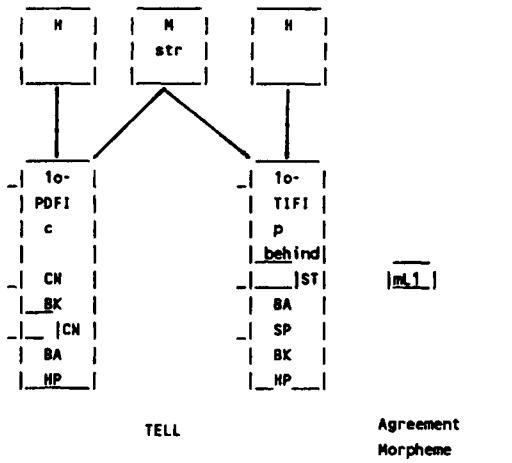


Figure 37. The shape of TELL with an object agreement morpheme.

nominal, and is inserted into specific places in the two feature bundles. The object agreement morpheme is determined by the person and location of the object and is similarly inserted into both articulatory bundles. Thus, the completed verb stem 3a-ASK-3b is composed of three morphemes: one root and two agreement morphemes.

In the examples of feature insertion discussed so far, the root contains only a small number of empty cells. Many other signs are built from roots that are specified only for segment type, and contain empty cells for

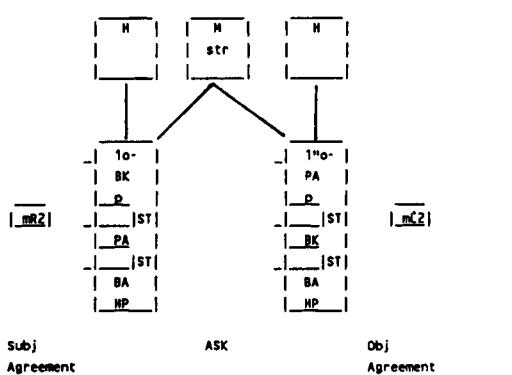


Figure 38. The shape of ASK with subject and object agreement morphemes.

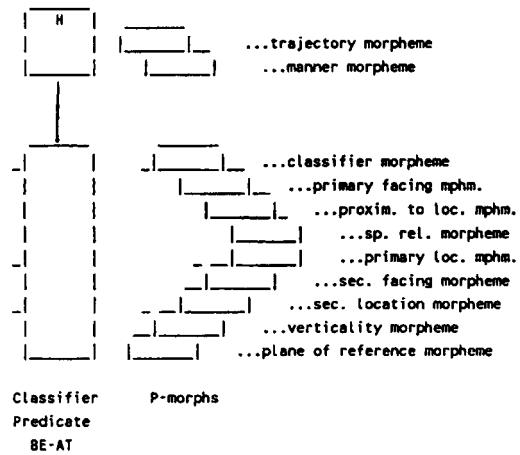


Figure 39. The composition of a classifier predicate.

all other segment features and all articulatory features. This class of signs has been referred to as “classifier predicates” by Liddell (1977), and “verbs of motion and location” by Supalla (1978), who first proposed the idea of movement roots in the analysis of these signs. Morphological processes insert a number of morphemes in appropriate cells to derive a polysynthetic predicate stem.

The type of information which can be inserted into such movement roots has been investigated in depth by Supalla (1978). We will not provide additional analysis here, but simply observe that this category of predicate is highly productive in ASL and is responsible for a significant number of the signs observed in ASL discourse.

5.2 Processes that Operate on Fully Specified Stems

The processes we describe below all operate on fully specified stems. Such stems can either come directly from the lexicon as completely specified s-morphs, or become fully specified through processes like those described above.

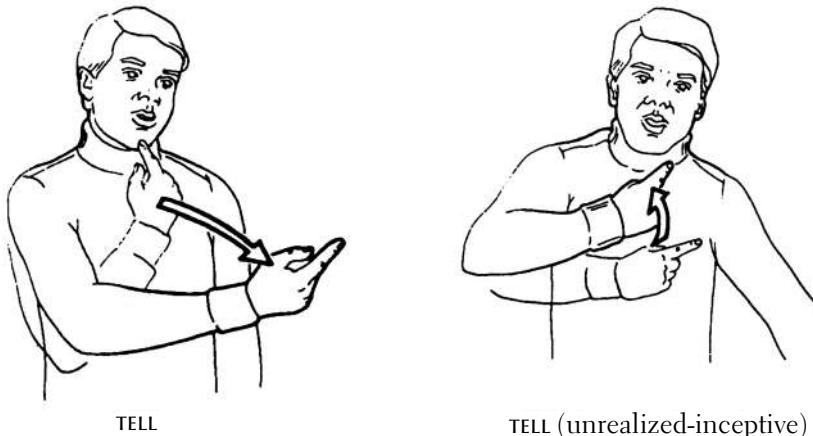


Figure 40. TELL and its unrealized-inceptive form.

5.2.1 Frames. Many ASL inflections have an unusual characteristic. Regardless of the syllable structure of the uninflected stem (the input to the process), the syllable structure of the inflected form (the output) is completely uniform. For example, Liddell (1984b) describes the verb inflection for unrealized-inceptive aspect. The input to the inflection could be a verb with a single segment, two segments, or even three segments. The inflected verbs, however, uniformly have the shape M H.

In this analysis the inflected verb is not strictly a modification of the verb stem, but rather results from feeding a small piece of articulatory information from the verb stem into a segmental structure referred to as an “inflectional frame.” Figure 41 shows the shape of the uninflected verb stem TELL, and its form when inflected for the unrealized-inceptive (U-I) aspect.

For verb stems in the same verb class as TELL, the initial feature bundle of the stem is identical to the final feature bundle of the U-I form of the verb. Further, all of their U-I forms have the form M H, and all have the same location features in the initial feature bundle. The inflectional frame is the phonological structure provided by the inflection

itself. This frame is not prefixed or suffixed onto the stem, but rather, serves as the phonological framework used to construct the inflected sign. The frame has a partially specified initial feature bundle, but no final bundle of features. For verbs like TELL, which begin in contact with the body, the initial bundle of articulatory features is removed from the stem and inserted into final position in the frame. The remainder of the phonological information from the verb stem does not appear in the inflected form.¹³ The resulting sign begins at the location specified by the inflectional frame and moves to what

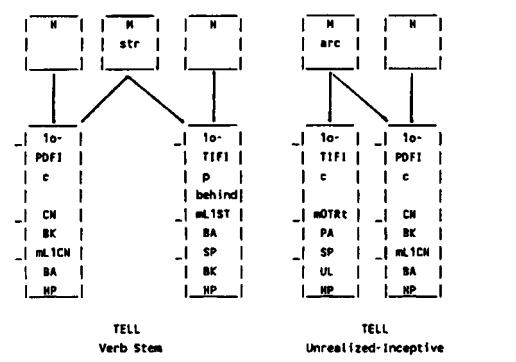


Figure 41. The stem TELL and its unrealized-inceptive form.

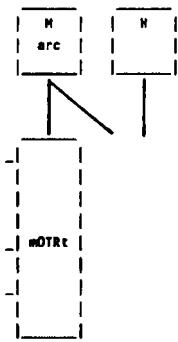


Figure 42. Unrealized-Inceptive Frame.

was the original location specified in the stem.

Many details have been left out of our description of this inflection. In fact, three

such frames (i.e., three allomorphs) are needed to account for the U-I data. A fuller account can be found in Liddell (1984b). There are a number of other ASL inflections which will naturally lend themselves to an analysis utilizing inflectional frames.

5.2.2 Reduplication. Reduplication is common in ASL. Habitual aspect and iterative aspect are each marked in ASL by a different type of reduplication rule.¹⁴ Figure 43 illustrates the form of the verb LOOK along with its habitual and iterative forms.

For purposes of our discussion, we will use the verb stem ASK, described earlier, and its habitual and iterative forms. The shape of

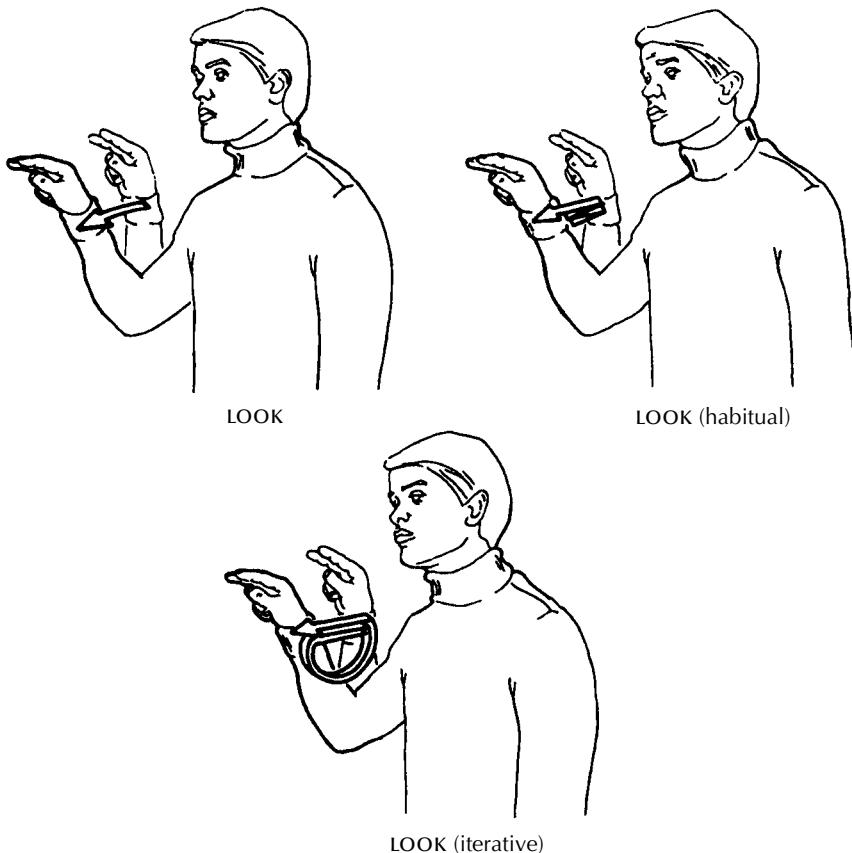


Figure 43. The habitual and iterative forms of LOOK.

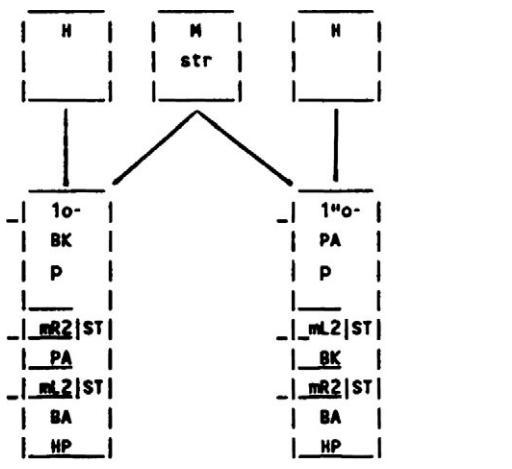


Figure 44. ASK

the movement of these forms is the same as that seen in Figure 44. The verb stem ASK is an incomplete S-morph. It has phonological cells which are filled with subject and object agreement morphemes.

After the subject and object agreement morphemes are inserted, the phonological structure of the stem is complete. Habitual aspect is then marked for the verb ASK through the application of a reduplication rule like the following:

Habitual Aspect Rule:

(for H M H signs)

| | | | | | | | | | | | | |
|-----|-----|-----|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | 2 | 3 | \rightarrow | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| srt | srt | srt | | srt |

The rule produces four copies of the verb stem and shortens each of the movements (srt).¹⁵ The application of this rule creates the environment for the M Epenthesis Rule described under phonological processes above.

The circled Ms are inserted between the final H of one repetition and the initial H of the next by the M Epenthesis Rule. Because none of those Hs are attached to articulatory bundles specified for body contact, the H

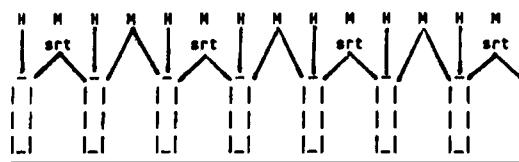


Figure 45. Habitual form after application of M Epenthesis.

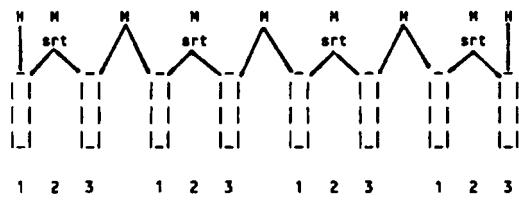


Figure 46. Surface form of ASK (habitual aspect).

Deletion Rule applies. It deletes every H except for the first and the last, producing the structure in Figure 45.

The epenthetic Ms and the feature bundles attach as shown in Figure 46. This produces what, for ASL, is a relatively long word consisting of nine segments.

A different and slightly more complicated reduplication rule could have applied, producing the iterative aspect.

Iterative Rule:

| | | | | | | | | | | | | | | |
|-----|-----|-----|---------------|-----|-----|-----|----------|-----|-----|-----|----------|-----|-----|------|
| 1 | 2 | 3 | \rightarrow | 1 | 2 | 3 | M | 1 | 2 | 3 | M | 1 | 2 | 3 |
| srt | srt | srt | | srt | srt | srt | Long arc | srt | srt | srt | Long arc | srt | srt | Long |

The application of this rule to ASK will produce the following structure (see Figure 47).

In this case the M Epenthesis Rule will not apply because the reduplication rule itself has already inserted a particular type of M

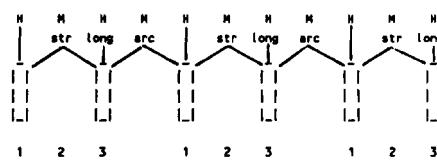


Figure 47. Result of application of iterative rule to ASK.

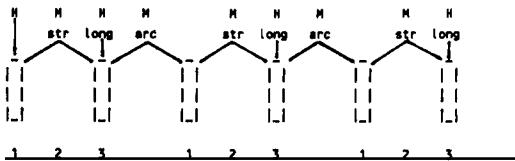


Figure 48. ASL (Iterative form) after H deletion is applied.

(with the feature “arc”) between each repetition of the stem. The rule has also marked some of the Hs with the feature [long], which prohibits application of the H Deletion Rule. The H Deletion Rule may apply to unlengthened Hs, however. Its application produces the structure in Figure 48.

The application of the Iterative Rule has also produced a rather long ASL sign, though its structure is significantly different from that produced by the Habitual Aspect Rule.

We will now summarize the morphological and phonological processes which have interacted to form these two forms of ASK. Each began as a phonologically incomplete stem. The stem was made complete through a morphological rule which inserts agreement morphemes into the stem. The completed stem then underwent one of the reduplication rules, which produced an aspectual inflection. The application of either of the reduplicative rules creates the environment for the application of one or more phonological rules. The phonological rules then apply to produce the correct surface form.

It has been common practice in the past to refer to signs which have undergone reduplication process as being marked by the phonological feature [+ redup] (Fischer and Gough, 1978; Supalla and Newport, 1978; Klima and Bellugi, 1979; Padden and Perlmutter, 1984). It should be clear from the two reduplication rules we have examined that such an approach is not adequate. The

two reduplicated forms do not differ from their stems by the single phonological feature [+/- redup]. They have undergone a reduplicative process which copies phonological segments, adds phonological features, and triggers the application of phonological rules.

5.2.3 Affixation. Across spoken languages, one of the most common phonological means for marking the application of a morphological process is the affixation of one or more segments to a stem. This also occurs in ASL, but it is uncommon. The one clear case is a nominalizing suffix having the structure M H. When suffixed to the verb TEACH, it produces a word meaning “teacher,” and, when suffixed to the noun LAW, it produces “lawyer.” This is the only ASL morpheme we know of which clearly has the status of an affix. Most ASL morphological activity involves filling in cells in phonologically incomplete segments, or operations on phonologically complete stems, which either modify them through the use of frames, or through some type of reduplicative process.

6. CONCLUSION

Early in this paper we suggested that, although the terminology of modern phonology would appear to eliminate signed languages from phonological analysis, the concepts that underlie the terminology are sufficiently broad to permit its application to the levels of organization of sign language. Our discussion of the phonetic, phonological, and morphological structures of ASL has been aimed at demonstrating the often surprising degree to which both the levels of organization and the processes and structures of ASL parallel those found in spoken languages. Thus, it should now be possible to refer to the phonetic structure, the morpheme

structure conditions, or the phonological processes of sign languages and be confident that what is being described is analogous to similar phenomena in spoken languages. This potential for comparison permits an expansion of our knowledge about language universals, and should encourage the description of some of the dozens of independent sign languages of the world.

More importantly, the unique lexical structures and morphological processes we have identified and described add to our knowledge of the variety of forms of human language.

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AUTHOR NOTE

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NOTES

1. It might be possible to argue that in many cases, the hold at the end of a sign is simply the physiological result of making contact with the body. It is not difficult to demonstrate that this is not so. The sign KNOW moves toward the forehead, makes contact, then stops briefly in contact with the forehead. It can be described as ending with hold manner. Liddell (1984a) reports the occurrence of a noncontacting form of the sign in which the hand approaches but does not touch the forehead and in which the sign still ends with hold manner.
2. In actuality, discourse strings must be represented as several simultaneous strings: one for each hand, since each produces segments, and one for each linguistically independent complex of torso, head, and facial behaviors. For the moment we are focusing on segments and strings of segments produced by a single hand.
3. Earlier work treated these as features of hand configuration (Liddell, 1984a). There is evidence for their independence from hand configuration, however, in the fact that certain of the local movements function as the sole manual markers of inflectional morphemes attached to signs which have plain (i.e., nonmoving) hand configurations in their uninflected forms.
4. It may be that a single feature such as "contracting" unifies both hooking and flattening.
5. For certain hand configurations and under certain discourse conditions it is possible to achieve twisting and nodding with the elbow joint rather than the wrist joint. For example, the sign WHERE is typically performed by twisting the wrist but by changing the hand configuration to one with a straight, rigid wrist the twisting can be transferred to the elbow. Similarly, YES which normally nods at the wrist may nod at the elbow in its emphatic form.
6. This sign also inflects for subject agreement. In fact, the example shown in Fig. 22 is the appropriate one for a first person subject, but we will not deal with this issue here.
7. Recently introduced signs for representing English words whose spellings begin with *r* use three other hand parts in POC: PA (RELAX), UL (RIGHT), RAFI (REALLY), but the use of such introduced signs is highly constrained.
8. A treatment whereby lexical forms of such signs contain terminal M segments and H segments are inserted finally would also have to propose that the initial H segments were also inserted by phonological process. This is not an appealing solution, however, since there exist signs with initial M segments that are not preceded by H segments, even in isolation (WHEN). We know of no principled way to predict which signs would add an H and which would not. Moreover, a number of signs consist of only a hold in isolation but are deleted between Ms. The underlying M solution would clearly not work for such signs since they have no M. The alternative proposal would amount to a claim that they have no segmental structure in their underlying forms which appears to introduce unnecessary complication to a theory of lexical structure of ASL.
9. The feature bundles in these two signs share many features. That is, feature bundle "b" is closely related to feature bundle "B." Likewise, feature bundle "d" is very similar to feature bundle "D."
10. Hold Deletion may optionally apply to the first hold of this string, yielding an M M M H surface form. In addition, although the derivation is presented in ordered form, M Epenthesis and Metathesis appear to be unordered with respect to each other.
11. Many of these are analyzed in detail in Liddell, Ramsey, Powell, and Corina (1984).
12. In ASL discourse any nominal may be assigned a grammatical association with a spatial location or vector. The process of assigning this association has been called "indexing" and the location or vector associated with the nominal has been called its "index." While ASL pronouns may make reference to a nominal by pointing at its index, verbs such as TELL and ASK agree with their subject and object nominals through the insertion of agreement morphemes. The agreement morphemes are morphs, the phonological form of which is a specification determined by the location of the index of a nominal.
13. We hesitate to talk about "deletion" here since this constructive process may take place within the lexicon. If so, then the process merely copies (reads, selects) specific information from the lexical entry of the stem and there is nothing to delete.
14. The data on these aspects are from Klima and Bellugi (1979), who first described them.
15. The actual number of repetitions can vary. For example, it could easily be produced with three rather than four repetitions.

File 5.1: Morphology: Words and Word Formation

A continuous stream of speech can be broken up by the listener (or linguist) into smaller, meaningful parts. A *conversation*, for example, can be divided into *sentences* of the conversation, which can in turn be divided into the *words* that make up the sentences of the conversation.

Every language has some (large) number of words available for its users to choose from as they need. This stock of words can be thought of as a sort of mental dictionary that language users, both speakers and hearers, have internalized as part and parcel of learning their particular language. We call this mental dictionary the **lexicon**, and it is useful at this point to think briefly about what words are like.

5.1.1 WHAT ARE WORDS LIKE?

Most everyone has an idea of what a word is, but it's not the case that each word is equally distinct from every other word. Consider the following question:

Are *cat* and *dog* the same word or different words?

Your answer, like that of almost anyone familiar with English, is very probably “Of course they are different words! Isn’t it obvious?” The reasons why this is obvious include both differences in *form*, that is, what a word sounds like when spoken (/kæt/ is quite distinct from /dæg/; see File 3.2 for help

with any unfamiliar symbols) and differences in *meaning*, such as the fact that you cannot simply use *cat* and *dog* interchangeably to mean the same thing.

On the other hand, you might say *cat* and *dog* are both kinds of pets, so the words aren’t 100% different, they do have something to do with each other. Likewise, and not coincidentally, both *cat* and *dog* belong to the same “part of speech” class, that is, *noun* (often defined as “the name of a person, place, thing, or idea”). These sorts of similarities, however, are not enough to lead us to claim that *cat* and *dog* are the same word.

So, the idea of “same” or “different” with respect to words can be an unexpectedly complicated one. Words each have a number of attributes, or ways in which they can be categorized. Now consider this question:

Are *cat* and *category* the same word or different words?

Based on the discussion above, most readers might hesitate before answering this question. These two words share some elements of form, the /kæt/ part, but *category* doesn’t seem to have the meaning of *cat* anywhere in it. Similarly with the words *kid* and *kidney*—they may sound partly the same, but it seems that they are not actually related in their meaning after all. Even though it sounds like there could be a *cat* in *catalogue*,

or a *kid* in *kidney*, and such a connection might even be used as a source of humor in a joke or cartoon, English speakers consistently distinguish these pairs as each containing two unrelated words.

The thought that one word could be found “inside” another word is an important one. Consider this further question:

Are *cat* and *catty* (“spiteful”) the same word or different words?

Here, the connection is a good bit closer than in the preceding word comparisons. Good companions though they may be, cats have gained a reputation for being sometimes vicious fighters, and it is most probably in this context that the word *catty* came into existence as part of the English language, meaning something like “behaving like a cat in a certain respect.” So the words *cat* and *catty* are similar not only in terms of their form (the /kæt/ part) but also in terms of their

CAT

| | |
|-----------------|-----------------------|
| Form: | /kæt/ |
| Meaning: | ‘domesticated feline’ |
| Part of Speech: | noun |

With respect to form, *cat* is obviously a smaller word (i.e., contains fewer sounds) than *catty*. The meaning of *catty* also seems to be based on the meaning of *cat*, rather than the other way around. This suggests that *catty* is based on *cat* or, in other words, that *cat* is the **root** on which *catty* is built. This process of creating words out of other words is called **derivation**. Derivation takes the phonological form of one word and performs one or more “operations” on it, the result being a (possible) new word. In the simplest case, the phonological form of the root is used “as-is,” and one or more pieces of additional form are tacked on to that. We talk of the form of the root as the **stem**, and the added pieces as **affixes**. In the

meaning, since both (at least potentially) engender the image of “nasty fighting.”

Is this enough to say that *cat* and *catty* are instances of the same word, then? Recall that evaluating “sameness” and “difference” between words involves several factors. If we compare *cat* and *catty* with respect to their part of speech, for instance, we note that whereas *cat* is a noun, *catty* is an *adjective* (a word used to describe a noun). Even though *cat* and *catty* share elements of form and elements of meaning, the fact that the words belong to different part of speech classes is a pretty clear sign that we are in fact dealing with two words, rather than two “versions” of one word. There remains the feeling, however, that *cat* and *catty* are “related” in a way that *cat* and *dog*, on the one hand, and *cat* and *catalogue*, on the other, were not. What is the nature of this relation? Let’s compare some of the attributes of the two words:

CATTY

| |
|---|
| /kæti/ |
| ‘spiteful, (fighting) like a domesticated feline’ |

case of *catty*, the root is the word *cat*, the stem is the phonological form of that root, /kæt/, and the affix is /i/, spelled -y, which is attached to the right edge of the stem.¹

At this point, there is one more question for you to consider:

Are *cat* and *cats* the same word or different words?

1. If you are wondering about the second “t” in *catty*, something not present in *cat*, it is important to notice that the ‘t’ is purely a spelling convention, and is not reflected directly in the pronunciation, that is, the /t/ in *catty* is not “twice as long” as the /t/ in *cat*. Although in many cases it does not cause any problems to refer to the spelling when talking about the structure of words, there are cases where the spelling can be misleading about what is actually going on with morphological processes.

In terms of phonological form, the difference between /kæt/ and /kæts/ is exactly the same in degree, that is, one additional sound, as the difference we saw between /kæt/ and /kæti/. With respect to meaning, however, *cat* and *cats* seem to refer to just

| CAT | | CATS | |
|-----------------|-----------------------|------|--------------------------------|
| Form: | /kæt/ | | /kæts/ |
| Meaning: | 'domesticated feline' | | 'domesticated feline' (plural) |
| Part of Speech: | noun | | noun |

This time the answer to the “same or different” question is not as obvious as it was in the earlier cases. *Cats* represents a different grammatical **form** of the word *cat*, used just in case we need to talk about more than one member of the class of *cat*. The creation of different grammatical forms of words is called **inflection**. Inflection uses the same sorts of pieces, such as stems and affixes, that derivation does, but the important difference is the linguistic entity that inflection creates—forms of words, not entirely new words. There are actually very few inflectional affixes in English, so it may help to collect them in one table for easy reference (see (1)).

Notice that all the inflectional affixes in the table are attached after the stem. Affixes that follow a stem are called **suffixes**, whereas affixes which precede a stem are called **prefixes**. In English, then, it is a safe

the same kind of thing, the difference being whether we want to talk about one (singular) or more than one (plural) of that thing. Moreover, these are both of the same part of speech class, noun.

bet that any prefix you encounter will be *derivational* and not *inflectional*. The reverse, however, is not true—there are both derivational and inflectional suffixes, so it will help to study the table in (1) carefully. Another thing to notice about affixes is that sometimes different meanings or functions can be marked by the same phonetic shape (note the three -s affixes in the table). Affixes that sound alike but have different meanings or functions are said to be **homophonous**. (Different words that sound the same are likewise said to be homophonous.) Another example is the case of *-er*, which can mark comparative degree on adjectives and adverbs (like in *taller*, *faster* in the table), but the same phonetic shape can be used to derive an agent noun from a verb, as in *speak*, *speaker*. These two *-er* affixes are homophonous with each other, and it is therefore important to consider both form and meaning

(1) The inflectional affixes of English

| Function | Affix(es) | Attaches to | Example |
|------------------------|-----------|---------------------|----------------------------------|
| 3rd per. sing. present | -s | verbs | She waits there at noon. |
| past tense | -ed | verbs | She waited there yesterday. |
| progressive aspect | -ing | verbs | She is waiting there now. |
| past participle | -en, -ed | verbs | Jack has eaten the cookies. |
| plural | -s | nouns | The chairs are in the room. |
| possessive | -'s | nouns | The chair's leg is broken. |
| comparative | -er | adjectives, adverbs | Jill is taller than Joe. |
| superlative | -est | adjectives, adverbs | Joe runs faster than Jill. |
| | | | Ted is the tallest in his class. |
| | | | Michael runs fastest of all. |

when you are analyzing morphological structures.

5.1.2 CLASSIFYING ELEMENTS IN MORPHOLOGY

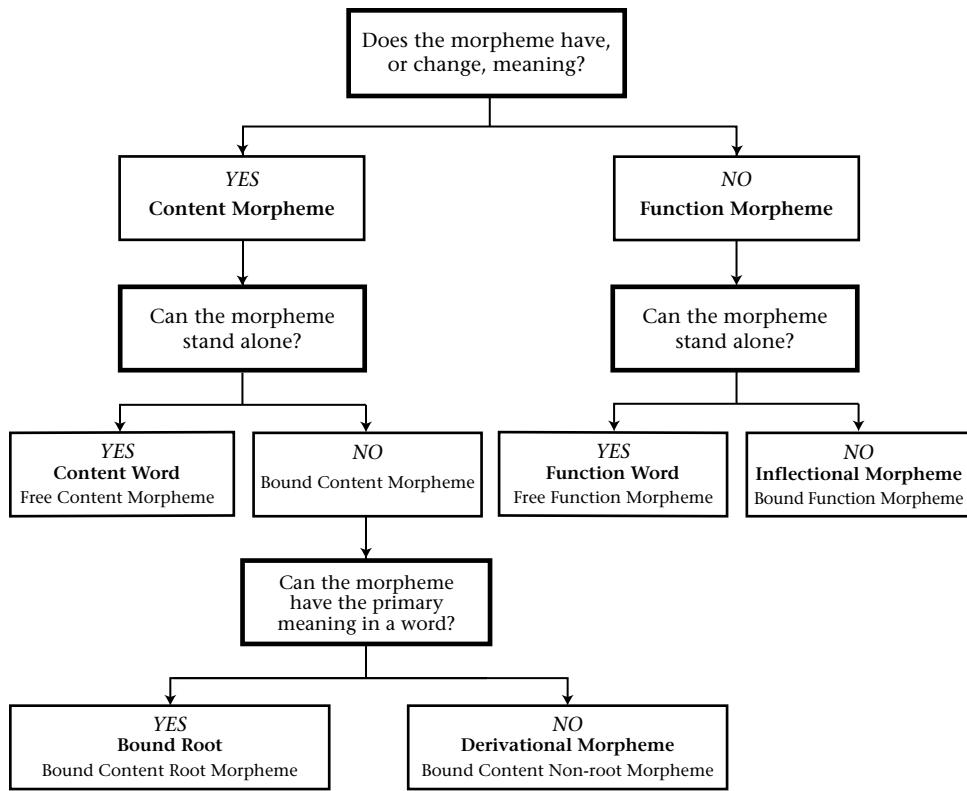
In the study of word formation, that is, **morphology**, the most basic acts of analysis are comparison (e.g., *cat* compared with *catty*) and segmentation, which allow one to see what the internal constituent parts of a word are. From such analysis, it becomes apparent that words and affixes do not have the same status in language overall. **Simple words** like *cat*, *dog*, *book*, and *walk* do not have any affixes and so cannot be broken down into smaller meaningful pieces. Single, irreducible meaningful pieces are called **morphemes**, and we can categorize morphemes in several ways. Morphemes such as the simple words above are called **free morphemes** because they can be used as words all by themselves. Affixes, on the other hand, always have to be attached to the stem of some word in order to be used. Because they cannot stand alone, affixes are also called **bound morphemes**. Affixes are not the only things that can be *bound*. There are some roots that do not have stand-alone forms, that is, they only appear with one or more affixes attached. For example, the words *infer*, *confer*, *refer*, *defer*, *prefer*, and *transfer* all seem to have a root *-fer* (stem /fɪ/) with a prefix attached to its left. This root, however, does not correspond to any free morpheme in English. Morphemes of this sort are called **bound roots** because although they do seem to have some associated basic meaning (in the case of *-fer*, the meaning is something like ‘carry, bring’),

they are unable to stand alone as words in their own right. Other examples are *-ceive* (*conceive*, *receive*, *deceive*) and *-sist* (*resist*, *desist*, *consist*, *subsist*). Can you think of a single basic meaning for each of these bound roots?

While we have defined *morphemes* as meaningful pieces, there are differing degrees of meaningfulness. Some morphemes carry semantic content. That is, some simple words have some kind of identifiable meaning (e.g., *moose*, *car*, *house*, etc.), and some affixes indicate a change in meaning with respect to the root to which they attach (e.g., *re-play* means ‘play again’). Morphemes of this sort are called **content morphemes**. Any affix which, when added to a stem, produces a word which belongs to a different part of speech class, such as turning nouns into adjectives (like *-y* above) or turning verbs into nouns (like *-ment* in *establish* → *establishment*), is also considered to be part of the **content morpheme** class. Other morphemes serve only to provide information about grammatical function by relating certain words of a sentence to each other. Words that do this are, for example, prepositions such as *at*, *for*, and *by*. Articles (*a*, *an*, *the*) and conjunctions (*and*, *but*, *or*) are also words of this sort. Affixes that perform this function are the inflectional affixes, such as *-s* mentioned above, which marks noun words as plural. These grammatical morphemes are called **function morphemes**. The content/function distinction thus cross-cuts the free/bound distinction.

Given any particular morpheme, the diagram in (2) may help you decide what sort of morpheme it is.

(2) A decision tree for finding out the status of morphemes



File 5.3: The Hierarchical Structure of Derived Words

When we examine words composed of only two morphemes, a stem and a derivational affix, we implicitly know two facts about the ways in which such affixes join with their stems. First, the stems with which a given affix may combine (their **input**) normally belong to the same part of speech class. For example, the suffix *-able* attaches freely to verbs, but not to adjectives or nouns; thus, we can add this suffix to the verbs *adjust*, *break*, *compare*, and *debate*, but not to the adjectives *asleep*, *lovely*, *happy*, and *strong*, nor to the nouns *anger*, *morning*, *student*, or *success*. Second, the words formed by the addition of a given derivational affix to some stem (their **output**) also normally belong to the same part of speech class. For example, the expressions resulting from the addition of *-able* to a verb are always adjectives; thus *adjustable*, *breakable*, *comparable*, and *debatable* are all adjectives.

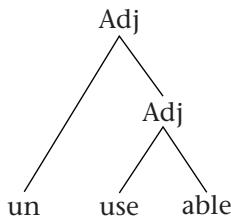
These two facts have an important consequence for determining the way in which words with more than one derivational affix must be formed. What it means is that you can trace the derivational history of words as if they were formed in steps, with one affix attaching to a stem. Words with more than one affix can be represented as forming by means of several steps. For example, consider the word *unusable*, which is composed of a prefix *un-*, a stem *use*, and a suffix *-able*. One possible way this morphologically com-

plex word might be formed is all at once, as in: *un + use + able*, where the prefix and the suffix attach at the same time to the verb stem *use*. This cannot be the case, however, knowing what we know about how derivational affixes are restricted with respect to both their input and their output. The prefix *un-*, meaning ‘not’, attaches only to adjectives and creates new words that are also adjectives. (Compare with *unkind*, *unwise*, and *unhappy*.) The suffix *-able*, on the other hand, attaches to verbs and forms words that are adjectives. (Compare with *stoppable*, *doable*, and *washable*.) Therefore, *un-* cannot attach to *use*, since *use* is a verb and not an adjective. However, if *-able* attaches first to the stem *use*, then it creates an adjective, *usable*, and the prefix *un-* is allowed to combine with it. Thus, the formation of the word *unusable* is a two-step process whereby *use* and *-able* attach first, then *un-* attaches to the word *usable*.

Recall that what we are analyzing is the internal structure of words. Words, since they are ‘layered’ in this way, have a special type of structure characterized as **hierarchical**. This hierarchical structure can be schematically represented by means of a tree diagram that indicates the steps involved in the formation of the word. In this way, the output of one affixation serves as the input for the next, and the restrictions that each class is subject to can help us determine the

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sequence of derivation. The tree for *unable* is:

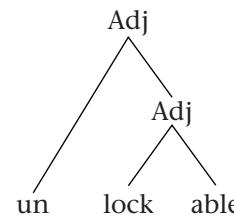


Now consider the word *reusable*. Both the prefix *re-* and the suffix *-able* attach to verbs, but we have already shown that one must attach first. Which is it? Notice that *reusable* cannot be regarded as the result of adding the prefix *re-* to the word *usable*, since *re-* attaches only to verbs (compare with *redo*, *relive*, and *repossess*) and *usable* is an adjective. However, *-able* can attach to the verb *reuse*, since *-able* attaches to verbs. Thus, our understanding of how the affixes *re-* and *-able* combine with other morphemes allows us to conclude that the verb *reuse*, but not the adjective *usable*, is a step in the formation of the adjective *reusable*.

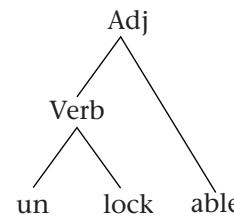
Interestingly, some words are **ambiguous**, that is, they have more than one meaning. When we examine their internal structure, we find an explanation for this: their structure may be analyzed in more than one way. Consider, for example, the word *unlockable*. This could mean either ‘not able to be locked’ or ‘able to be unlocked’. If we made a list to determine the parts of speech the affix *un-* attaches to, we would discover that there are actually *two* prefixes which have the form *un- /ʌn/*. The first combines with adjectives to form new adjectives and means ‘not’. (Compare with *unaware*, *unintelligent*, or *unwise*.) The second prefix *un-* combines with verbs to form new verbs and means ‘do the reverse of’. (Compare with *untie*, *undo*, or *undress*.)

Remember from Files 5.1 and 5.2 that even though these prefixes sound alike, they

are entirely different morphemes. Because of these two different sorts of *un-* in English, *unlockable* may be analyzed in two different ways. First, the suffix *-able* may join with the verb *lock* to form the adjective *lockable* meaning ‘able to be locked’; *un-* may then join with this adjective to form the new adjective *unlockable*, with the meaning ‘not able to be locked’. This way of forming *unlockable* is schematized in the following tree:



The second *unlockable* is formed as follows. The prefix *un-* joins with the verb *lock* to form the verb *unlock*, meaning ‘do the reverse of lock’. The suffix *-able* then joins with this verb to form the adjective *unlockable*, with the meaning of ‘able to be unlocked’. This manner of forming *unlockable* is represented in the following tree:



5.3.1 MORPHEMES AND PARTS OF SPEECH

There are a few prefixes that do not attach exclusively to one part of speech. For example, consider the prefix *pre-*. *Pre-* attaches to verbs and results in a change of meaning, but not part of speech class, in the words it derives, although the word class (part-of-speech) itself does not change, as the following examples show:

| | |
|--------------|------------------------|
| preexist | preboard (an airplane) |
| predetermine | predestine |
| premeditate | prescreen (a movie) |

However, there are examples of words with the prefix *pre-* that do not follow the same pattern as those cited above:

| | |
|-----------|---------|
| preseason | predawn |
| prewar | pregame |

In these words *pre-* attaches to a noun and forms an adjective (*the preseason game*, *the prewar propaganda*, *the pregame warm-up*). However, the meaning associated with the prefix is the same as in *preexist*, *preboard*, etc. (although its function is different). In addition, there are sets of words such as:

| | |
|-------------|-------------|
| prefrontal | predental |
| preinvasive | prehistoric |

In these words, *pre-* is attaching to an adjective, forming adjectives, and again the same meaning is associated with the addition of

pre- as in *preexist*, *preboard*, etc. So, even though it is generally the case that a given affix will be subject to one particular set of conditions on the part of speech class which it can attach to and on the part of speech class that its resulting derived words will belong to, some morphemes have a much wider range of combinatorial possibilities (historically this may represent an extension from one or two of the productive uses). Such must be the case with *pre-*. Note, however, that what *pre-* combines with and what the combination produces are not totally random or arbitrary. When *pre-* attaches to verbs, it forms only verbs. When it attaches to nouns, it forms only adjectives, and when it attaches to adjectives, it forms only adjectives. So, it is advisable to consider many examples when attempting to determine the generalization about how a given affix combines with stems.

File 5.4: Morphological Processes

In the previous files of this section on morphology, we have been looking at how words and grammatical forms of words are put together. We have seen that English makes use of derivational affixes to create more words than would exist with only free morphemes. Of course, English is not the only language that enlarges its vocabulary in this way. When linguists observe a language which uses affixation to form additional words, they note that the occurring combinations are systematic, i.e., rule-governed, as we have certainly seen is the case in English (recall that the prefix *re-* takes only verbs as input, and the suffix *-able* produces only adjectives as output). Because these combinations are rule-governed, we can say that a *process* is at work, namely, a **word formation process**, since new words or forms of words are being formed. What we will consider in this file are the ways in which languages create new words from existing words, and the grammatical forms of words. (See Files 12.6 and 12.7 for still more ways in which new words come into use in a language.)

Before describing some of the word formation processes found in the world's languages, we must first address the question, In what sense is it meant that new words are being "formed"? Do we mean that every time a speaker uses a morphologically complex word, the brain reconstructs it? Some linguists would maintain that this is the case.

They would claim that in a speaker's mental dictionary, the lexicon, each morpheme is listed individually, along with other information such as its meaning, its part of speech (if a free morpheme), and possibly a rule naming its input and output part(s) of speech, if it is a bound morpheme. Thus, each time a word is used, it is re-formed from the separate entries in the lexicon. There is evidence, however, that indicates this is not actually the case; even morphologically complex words apparently have a separate entry in the adult lexicon. Even if language users do not 'build' morphologically complex words and word-forms every time they use them, there are other reasons, though, to consider derivation a process of word formation. In the context of the description of a language, the term **formation** refers to the systematic relationships between roots and words *derived* from them, on the one hand, and between a word and its various *inflected*, i.e., grammatical, forms, on the other. Speakers of a given language, however, are also often aware of these relationships. We see evidence of this when new words are formed based on patterns that exist in the lexicon. For example, a speaker of English may never have heard words such as *un-smelly*, *smellness*, or *smellful* before, but he or she would certainly understand what they mean. The word *stick-to-it-ive-ness* causes some prescriptivists to wail; why create this

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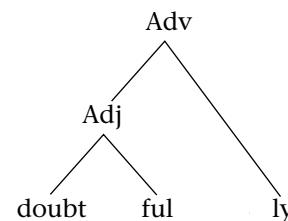
new word when a perfectly good word, *perseverance*, already exists? This word illustrates that speakers of a language have no problem accessing the patterns in their lexicons and applying them for new creations or for interpreting unfamiliar words.

Rules that speakers actually apply to form words that are not currently in use in a language are termed **productive** rules. English has examples of nonproductive morphemes as well; for example, the suffix *-tion* is generally not used by speakers to form new nouns, whereas the suffix *-ness* is. Over long periods of time, different affixes or other morphological processes may become more or less productive (see File 12.6). There was a time in recent American popular usage when the suffix *-age* (as in established lexical items *mileage* and *roughage*) was applied productively to roots from several part of speech classes to form new nouns meaning “some unspecified amount of (root),” for example *beerage* ‘some amount of beer,’ *spoilage* ‘some amount of spoiled material,’ *tun(e)age* ‘some amount of music (tunes),’ and so on. These words are/were acceptable on a socially and perhaps regionally limited basis, that is, they are not equally known to or used by all speakers of English. In a way, therefore, productivity in word formation is somewhat analogous to fads and fashion, in that new items are introduced in particular groups or communities, and these may or may not spread and become popular in the wider population of consumers (in this case, language users).

a. Affixation

To this point, our morphological discussion has been limited to the process of **affixation**. Although English uses only **prefixes** and **suffixes**, many other languages use **infixes** as well. Infixes are inserted *within* the root morpheme. Note that English really has no infixes. At first glance, some students think that

-ful in a word like *doubtfully* is an infix because it occurs in the middle of a word. However, if we examine the hierarchical structure of the word (see the diagram below), we find that the *-ly* suffix attaches not to the affix *-ful* but rather to a complete word, *doubtful*. Thus *-ful* attaches to the word *doubt* as a suffix and does not in fact break up the root morpheme *doubt*.



Tagalog, one of the major languages of the Philippines, uses infixes quite extensively. For example, the infix *-um-* is used to form the infinitive form of verbs:

| Verb stem | | Infinitive | |
|-----------|-------------|------------|-------------------|
| sulat | ‘write’ | sumulat | ‘to write’ |
| bili | ‘buy’ | bumili | ‘to buy’ |
| kuha | ‘take, get’ | kumuha | ‘to take, to get’ |

b. Compounding

Compounding is a process that forms new words not by means of affixes but from two or more independent words. The words that are the parts of the compound can be free morphemes, words derived by affixation, or even words formed by compounding themselves. Examples in English of these three types include:

| | | |
|------------|-----------------|-------------------------|
| girlfriend | air-conditioner | lifeguard chair |
| blackbird | looking-glass | aircraft carrier |
| textbook | watch-maker | life-insurance salesman |

Notice that in English compound words are not represented consistently in writing. Sometimes they are written together, sometimes they are written with a hyphen, and

sometimes they are written separately. We know, however, that compounding forms words and not just syntactic phrases, regardless of how the compound is spelled, because the stress patterns are different for compounds. Think about how you would say the words *red neck* in each of the two following sentences:

1. The wool sweater gave the man a red neck.
2. If you want to make Tim really angry, call him a redneck.

Compounds that have words in the same order as phrases have primary stress on the first word only, while individual words in phrases have independent primary stress. Some other examples are listed below. (Primary stress is indicated by ' on the vowel.)

Compounds Phrases

| | |
|-----------|------------|
| bláckbird | bláck bírd |
| mákeup | máke úp |

Other compounds can have phrasal stress patterns, but only if they can't possibly be phrases. These same compounds might also have stress on the first word only, like other compounds. For example:

Compounds Phrases

| | |
|------------|------------|
| eásy-going | eásy-góing |
| mán-made | mán-máde |
| hómemáde | hómemáde |

German is one of the many other languages that use compounding to form new words. Some examples of the numerous compounds in German are:

| | |
|----------------------------|---------------------------------------|
| Muttersprache | 'native language' < 'mother language' |
| Schreibtisch | 'desk' < 'writing table' |
| stehenbleiben | 'stand (still)' < 'stay remain' |
| Wunderkind | 'child prodigy' < 'miracle child' |
| Geschwindigkeitsbegrenzung | 'speed limit' < 'speed limit' |

c. Reduplication

Reduplication is a process of forming new words either by doubling an entire free morpheme (**total reduplication**) or part of it (**partial reduplication**). English makes no systematic use of reduplication, but other languages do make sometimes extensive use of reduplication. Indonesian uses total reduplication to form the plurals of nouns:

| <i>Singular</i> | <i>Plural</i> |
|-----------------|---------------------|
| rumah 'house' | rumahrumah 'houses' |
| ibu 'mother' | ibuibu 'mothers' |
| lalat 'fly' | lalatlalat 'flies' |

Tagalog, on the other hand, uses partial reduplication to indicate the future tense of verbs:

| <i>Verb stem</i> | <i>Future tense</i> |
|------------------|----------------------|
| bili 'buy' | bibili 'will buy' |
| kain 'eat' | kakain 'will eat' |
| pasok 'enter' | papasok 'will enter' |

Notice that the reduplicated piece, the **reduplicant**, can be described phonologically as the first syllable of the stem.

In conjunction with the prefix *man-* (which often changes the initial consonant of a following morpheme to a nasal with the same place of articulation as the original ini-

tial consonant), Tagalog uses reduplication to derive words for occupations:

| | | | |
|--------------|-------------|------------------|-----------------------|
| [mamimili] | 'buyer' | < /maŋ+bi+bili/ | (cf. [bili] 'buy') |
| [manunulat] | 'writer' | < /maŋ+su+sulat/ | (cf. [sulat] 'write') |
| [maŋ?i?isda] | 'fisherman' | < /maŋ+?i+?isda/ | (cf. [?isda] 'fish') |

Since the phonological content of the reduplicated piece (the reduplicant) depends on the phonological shape of the stem it attaches to, the “morpheme” in reduplication is the *presence* of the reduplicant, rather than the phonological shape of the reduplicant.

d. Alternations

Besides adding an affix to a morpheme or copying all or part of the morpheme to make new words or make morphological distinctions, it is also possible to make morpheme-internal modifications, called **alternations**. While alternations have to do with the sounds in a particular word pair or larger word set, note that these alternations mark morphological distinctions, whereas the rules in the Phonology files (see Files 4.1–4.3) dealt with pronunciation independent of meaning. The following are examples of morphological alternations in English:

1. Although the usual pattern of plural formation is to add an inflectional morpheme, some English plurals make an internal modification:

| | | |
|-------|----------------|--|
| man | m <u>e</u> n | [æ] ~ [ɛ] ([æ] alternates with [ɛ] in these forms) |
| woman | w <u>o</u> men | [ʊ] ~ [ɪ] |
| goose | g <u>ee</u> se | [u] ~ [i] |
| foot | f <u>oo</u> t | [ʊ] ~ [i] |

2. The usual pattern of past and past participle formation is to add an affix, but some verbs also show an internal alternation:

| | | | |
|----------------|----------------|----------------|-------------|
| r <u>ī</u> ng | r <u>ā</u> ng | r <u>ū</u> ng | [i]~[ɛ]~[ʌ] |
| dr <u>ī</u> nk | dr <u>ā</u> nk | dr <u>ū</u> nk | |
| sw <u>ī</u> m | sw <u>ā</u> m | sw <u>ū</u> m | |
| fe <u>ē</u> d | fe <u>ā</u> d | fe <u>ū</u> d | [i]~[ɛ]~[ʌ] |
| hol <u>ē</u> d | hol <u>ā</u> d | hol <u>ū</u> d | [o]~[ɛ]~[ʌ] |

Some verbs show both an alternation and the addition of an affix to one form:

| | | |
|-------|-------|--------|
| break | broke | broken |
| speak | spoke | spoken |
| bite | bit | bitten |
| fall | fell | fallen |
| give | gave | given |

3. Although the above examples are all inflectional, sometimes a derivational relation such as a change in part of speech class can be indicated by means of alternations:

| | | | |
|------------|----------|-------------|----------|
| strife (n) | [straɪf] | strive (v) | [straɪv] |
| teeth (n) | [tiθ] | teethe (v) | [tið] |
| breath (n) | [breθ] | breathe (v) | [brið] |
| life (n) | [laɪf] | live (v) | [lɪv] |
| life (n) | [laɪf] | live (adj.) | [laɪv] |

Over the years, English has reduced the number and frequency of word-internal morphological markers and has increased the frequency of marking with affixes. From the examples in this section, however, it should be clear that many common words in English continue to be morphologically marked by means of alternations.

e. Suppletion

Languages that employ morphological processes to form words will usually have a regular, productive way of doing so according to one or more of the processes discussed above. They might also have some smaller classes of words that are irregular because they mark the same morphological distinction by another of these processes. Sometimes, however, a root will have one

or more inflected forms which is phonetically unrelated to the shape of the root. This completely irregular situation is called **suppletion** and usually occurs only in a few words of a language.

A small number of English verbs have suppletive past tenses:

| | | | |
|------|----|--------|------|
| [əm] | am | [wəz] | was |
| [go] | go | [went] | went |

Two common English adjectives have suppletive comparative and superlative forms:

| | | | | | |
|-------|------|--------|--------|----------|-------|
| [gʊd] | good | [bɛt̯] | better | [bɛst̯] | best |
| [bæd] | bad | [wɜːs] | worse | [wɜːst̯] | worst |

Note that there is simply no systematic similarity between the stems of these various inflected forms. Interestingly, verbs derived from the irregular *go* also show similar suppletion in their past stems: *undergo*, [past] *underwent*.

A Further Example

Any given language will likely have some example(s) of suppletion, but these typically constitute a minority class within the lexicon. Noun inflection in Classical Arabic provides another example of suppletion:

| | | | |
|----------|---------|---------|---------|
| [mar?at] | 'woman' | [nisā:? | 'women' |
|----------|---------|---------|---------|

The usual plural form for Classical Arabic nouns ending in [at], however, involves the lengthening of the vowel of this ending (a morphological alternation):

| | | | |
|------------|-------------|-------------|-------------|
| [dirā:sat] | '(a) study' | [dirā:sā:t] | 'studies' |
| [harakat] | 'movement' | [harakā:t] | 'movements' |

There are also some irregular plurals of nouns ending in [at] that involve other internal changes:

| | | | |
|-----------|------------|----------|-------------|
| [dʒumlat] | 'sentence' | [dʒumal] | 'sentences' |
| [fikrat] | 'thought' | [fikar] | 'thoughts' |

5.4.1 MORPHOLOGICAL TYPES OF LANGUAGES

Languages can be classified according to the way in which they put morphemes together to form words. There are two basic morphological types, **analytic** and **synthetic**, the latter having several subtypes.

a. Analytic Languages

Analytic languages are so called because they are made up of sequences of free morphemes—each word consists of a single morpheme, used by itself with meaning intact. Purely analytic languages, also called **isolating** languages, do not use prefixes or suffixes to compose words. Semantic and grammatical concepts which are often expressed in other languages (like English) through the use of suffixes are thus expressed in analytic languages by the use of separate words.

Mandarin Chinese is an example of a language that has a highly analytic (*isolating*) structure. In the example sentences below, for instance, the concept of plurality and the concept of a completed action in the past are communicated in Mandarin through the use of invariant function words rather than the use of a change of form (cf. English, *I* to *we* to indicate plurality) or the use of a variable affix (cf. English *-ed* for past tense).

- (1) [wɔ mən tan tçin] (tones omitted)
I plural play piano
'We are playing the piano'
- (2) [wɔ mən tan tçin lə] (tones omitted)
I plural play piano past
'We played the piano'

Note that the form of 'we' (I-plural) that is used in the subject position is [wɔ mən] and that the pronoun has the same form when it is used as the object, placed after the verb:

- (3) [ta da wɔ mən] (tones omitted)
s/he hit(s) I plural
 'S/he hits us'

Only the position of a word in a sentence shows its function. English is unlike Mandarin in this respect, since the personal pronoun *we* is changed in form to *us* when it is used as the object of a verb. But English is like Mandarin in that word order is used to show the functions of nouns in a sentence, and in that nouns (unlike pronouns) are not marked by affixes to show their functions. For example, in the sentence *Tracy likes cats* the noun *Tracy* functions as the subject and the noun *cats* as the direct object, but just the opposite is true of *Cats like Tracy*; these differences in function are signaled only by the order of words in the sentence.

b. Synthetic Languages

In synthetic languages, affixes or bound morphemes are attached to other morphemes, so that a word may be made up of several meaningful elements. The bound morphemes may add another element of meaning to the stem by indicating the grammatical function of the stem in a sentence. Recall that the term **stem** refers to that part of the word to which affixes are added. It may consist of one or more morphemes: for instance, in *reruns*, -s is added to the stem *rerun*, which is itself made up of two morphemes.

Hungarian is a synthetic language. In the examples below, bound morphemes show the grammatical functions of nouns in their sentences:

- (4) [ɔz əmber latjɔ ɔ kucat]
the man sees the dog-(object)
 'The man sees the dog'

 (5) [ɔ kucɔ latjɔ ɔz əmbərt]
the dog sees the man-(object)
 'The dog sees the man'

As mentioned above, in English it is the position in the sentence of the noun phrase *the man* or *the dog* that tells one whether the phrase is the subject or object of the verb, but in Hungarian a noun or noun phrase may appear either before or after the verb in a sentence and be recognized as the subject or object in either position because it is marked with a bound morpheme (the suffix [t]) if it is the direct object. (Other synthetic languages behave similarly.) So both examples below mean the same thing, even though the position of the noun phrase meaning 'the man' is different with respect to the verb meaning 'sees'.

- (6) [ɔ kucɔ la:tjɔ ɔz əmbərt]
the dog sees the man-(object)
 'The dog sees the man'

 (7) [ɔz əmbərt la:tjɔ ɔ kucɔ]
the man-(object) sees the dog
 'The dog sees the man'

Synthetic languages like Hungarian also use bound morphemes to indicate some concepts that English signals by means of free morphemes. For example, Hungarian indicates personal possession and location by the use of suffixes attached to the stem (*ha:z*, 'house'), whereas in English these concepts are expressed by the use of free morphemes. For example,

- (8) [ɔ ha:zunk zəld]
the house-our green
 'Our house is green'

 (9) [ɔ ha:zəd feher]
the house-your white
 'Your house is white'

 (10) [ɔ se:ked ɔ ha:zunkbən vɔn]
the chair-your the house-our-in is
 'Your chair is in our house'

c. Agglutinating Languages

To be more specific, the kind of synthesis (putting together) of morphemes we find in

Hungarian is known as **agglutination**. In agglutinating languages, like Hungarian, the morphemes are joined together relatively “loosely.” That is, it is usually easy to determine where the boundaries between morphemes are, e.g.,

- | | |
|---------------------|----------------------|
| (11) haz-unk-bőn | ha:z-od-bőn |
| <i>house-our-in</i> | <i>house-your-in</i> |
| ‘in our house’ | ‘in your house’ |
-
- | | |
|-------------------|------------------|
| (12) haz-őd | ha:z-unk |
| <i>house-your</i> | <i>house-our</i> |
| ‘your house’ | ‘our house’ |

Swahili is another example of an agglutinating language. Swahili verb stems take prefixes to indicate the person of the subject of the verb (first, second, or third) and also to indicate the tense of the verb, as in the following list of forms for the verb ‘read’.

- | | | |
|------------------------|-------------------|-------------------|
| (13) <i>ni-na-soma</i> | I-present-read | ‘I am reading’ |
| (14) <i>u-na-soma</i> | you-present-read | ‘You are reading’ |
| (15) <i>a-na-soma</i> | s/he-present-read | ‘S/he is reading’ |
-
- | | | |
|------------------------|----------------|--------------------|
| (16) <i>ni-li-soma</i> | I-past-read | ‘I was reading’ |
| (17) <i>u-li-soma</i> | you-past-read | ‘You were reading’ |
| (18) <i>a-li-soma</i> | s/he-past-read | ‘S/he was reading’ |
-
- | | | |
|------------------------|------------------|------------------|
| (19) <i>ni-ta-soma</i> | I-future-read | ‘I will read’ |
| (20) <i>u-ta-soma</i> | you-future-read | ‘You will read’ |
| (21) <i>a-ta-soma</i> | s/he-future-read | ‘S/he will read’ |

A second characteristic feature of agglutinating languages is that each bound morpheme carries (ordinarily) only one meaning: *ni* = ‘I’, *u* = ‘you’, *a* = ‘s/he’, *na* = ‘present’, etc.

d. Fusional Languages

In **fusional languages**, another subtype of synthetic language, words are formed by adding bound morphemes to stems, just as in agglutinating languages, but in fusional languages the affixes may not be easy to separate from the stem. It is often rather hard to tell where one morpheme ends and the next begins; the affixes are characteristically fused with the stem.

Spanish is a fusional language that has suffixes attached to the verb stem to indicate the person (I/you/he/she/it) and number (singular/plural) of the subject of the verb. It is often difficult to analyze a verb form into its stem and suffix, however, because there is often a fusion of the two morphemes. For example, in the forms:

- | | |
|-------------------|--------------------|
| (22) <i>hablo</i> | ‘I am speaking’ |
| (23) <i>habla</i> | ‘S/he is speaking’ |
| (24) <i>hablé</i> | ‘I spoke’ |

these morphemes can be isolated:

- | | |
|---------------|-------------------------------------|
| [<i>-o</i>] | first person singular present tense |
| [<i>-a</i>] | third person singular present tense |
| [<i>-e</i>] | first person singular past tense |

However, although these forms would suggest a stem *habl-* that means ‘speak’, such a form never appears in isolation in Spanish. In the following forms:

- | | |
|----------------------|---------------------|
| (25) <i>hablamos</i> | ‘We are speaking’ |
| (26) <i>hablan</i> | ‘They are speaking’ |

where these morphemes can be isolated:

- | | |
|-----------------|-----------------------------------|
| [<i>-mos</i>] | first person plural present tense |
| [<i>-n</i>] | third person plural present tense |

it seems possible to say that the verb stem is *habla-*, to which the suffixes [*-mos*] and [*-n*] are added. But in the case of examples (22), (23), and (24) above, it is apparent that if there is a stem *habla-*, it has been fused together with the suffixes [*-o*], [*-a*], and [*-e*].¹

Fusional languages often differ from agglutinating languages in another way as well: agglutinating languages usually have only one meaning indicated by each affix, as noted above, but in fusional languages a single affix may convey several meanings simultaneously. Russian is a fusional language in which bound morphemes attached

1. An alternative analysis to account for the form in example (23) is to posit that *habla-* has a “zero-suffix” for 3rd person singular past tense.

to verb stems indicate both the person and number of the subject of the verb and the tense of the verb at one and the same time. For example, in the verb form:

- (27) [tʃitajet] ‘s/he is reading’

the bound form [-jet] signifies third person as well as singular and present tense. In the form:

- (28) [tʃital] ‘he was reading’

the suffix [-l] means singular, masculine, and past tense, simultaneously. (Compare the Swahili examples above, where person and tense are signaled by separate affixes.)

e. Polysynthetic Languages

In some synthetic languages, highly complex words may be formed by combining several stems and affixes; this is usually a matter of making nouns (subjects, objects, etc.) into parts of the verb forms. Sora, a language spoken in India, allows such **incorporation** of objects (subjects, instruments, etc.) into verbs:

- (29) [anin n̩am - jɔ - te - n]
 he catch fish non-past do
 ‘He is fish-catching’
 i.e., ‘He is catching fish’

- (30) [n̩am - kid - te - n - ai]
 catch tiger non-past do first person agent
 ‘I will tiger-catch’
 i.e., ‘I will catch a tiger’

Such verbs are roughly comparable to an English construction like *baby-sit* or *trout-fish*, but the polysynthetic constructions may be more complex, including several nouns as well as a variety of other affixes:

- (31) [pɔ - pouŋ - koon - t - am]
 stab belly knife non-past you (sg.)
 ‘(Someone) will stab you with a knife in (your)
 belly’

- (32) [nɛn - ədʒ - dʒa - dar - si - əm]
 I not receive cooked rice hand you (sg.)
 ‘I will not receive cooked rice from your hands’

The incorporated or “built-in” form of the noun is not necessarily identical to its free form. In Sora, the free form of ‘tiger’ is [kina], that of ‘hand’ is [si?i], that of ‘knife’ is [kondi].

5.4.2 SUMMARY

From the discussion we can extract the following statements about language types:

1. *Analytic* languages build up the meanings of sentences through the use of isolated morphemes. They do not use affixes (prefixes or suffixes).
2. *Synthetic* languages build up the meanings of sentences by combining free and bound morphemes to make up words.
 - a. *Agglutinating* languages are languages in which the affixes can easily be separated from the stems to which they are attached and in which each affix generally conveys only one meaning.
 - b. *Fusional* languages are languages in which the affixes and the base to which they are attached are fused together in pronunciation as a result of phonological processes or change, and therefore they are not easily separated from one another. In addition, there is generally a fusion of meanings that is represented by the affixes in such languages.
 - c. *Polysynthetic* languages are languages in which several stem forms may be combined (along with affixes) into a single word. Such a word is usually a verb with its associated nouns “built-in” or incorporated, so that the verb alone expresses what seems to us to be about the equivalent of a whole sentence.

It is important to note that languages are rarely “pure” types. Although particular languages may tend to be primarily one or another type with respect to morphology, they usually combine elements of a variety of types.

The Confluence of Space and Language in Signed Languages

KAREN EMMOREY

Expressed by hands and face rather than by voice, and perceived by eye rather than by ear, signed languages have evolved in a completely different biological medium from spoken languages. Used primarily by deaf people throughout the world, they have arisen as autonomous languages not derived from spoken language and are passed down from one generation of deaf people to the next (Klima and Bellugi 1979; Wilbur 1987). Deaf children with deaf parents acquire sign language in much the same way that hearing children acquire spoken language (Newport and Meier 1985; Meier 1991). Sign languages are rich and complex linguistic systems that manifest the universal properties found in all human languages (Lillo-Martin 1991).

In this chapter, I will explore a unique aspect of sign languages: the linguistic use of physical space. Because they directly use space to linguistically express spatial locations, object orientation, and point of view, sign languages can provide important insight into the relation between linguistic and spatial representations. Four major topics will be examined: how space functions as part of a linguistic system (American Sign Language) at various grammatical levels; the relative efficiency of signed and spoken languages for overt spatial description tasks; the impact of a visually based linguistic system on performance with nonlinguistic tasks;

and finally, aspects of the neurolinguistics of sign language.

5.1 MULTIFUNCTIONALITY OF SPACE IN SIGNED LANGUAGES

In this section, I describe several linguistic functions of space in American Sign Language (ASL). The list is not exhaustive (for example, I do not discuss the use of space to create discourse frames; see Winston 1995), but the discussion should illustrate how spatial contrasts permeate the linguistic structure of sign language. Although the discussion is limited to ASL, other signed languages are likely to share most of the spatial properties discussed here.

5.1.1 Phonological Contrasts

Spatial distinctions function at the sublexical level in signed languages to indicate phonological contrasts. Sign phonology does not involve sound patterning or vocally based features, but linguists have recently broadened the term *phonology* to mean the “patterning of the formation units of the expression system of a natural language” (Coulter and Anderson 1993, 5). Location is one of the formation units of sign language phonology, claimed to be somewhat analogous to consonants in spoken language (see Sandler 1989). For example, the

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Figure 5.1. Example of a phonological contrast in ASL. These signs differ only in the location of their articulation.

ASL signs SUMMER, UGLY, and DRY¹ differ only in where they are articulated on the body, as shown in Figure 1.

At the purely phonological level, the location of a sign is articulatory and does not carry any specific meaning. Where a sign is articulated is stored in the lexicon as part of its phonological representation.² Sign languages differ with respect to the phonotactic constraints they place on possible sign locations or combinations of locations. For example, in ASL no one-handed signs are articulated by contacting the contralateral side of the face (Battison 1978). For all signed languages, whether a sign is made with the right or left hand is not distinctive (left-handers and right-handers produce the same signs—what is distinctive is a contrast between a dominant and nondominant hand). Furthermore, I have found no phonological contrasts in ASL that involve left-right in signing space. That is, there are no phonological minimal pairs that are distinguished solely on the basis of whether the

signs are articulated on the right or left side of signing space. Such left-right distinctions appear to be reserved for the referential and topographic functions of space within the discourse structure, syntax, and morphology of ASL (see below). For a recent and comprehensive review of the nature of phonological structure in sign language, see Corina and Sandler (1993).

5.1.2 Morphological Inflection

In many spoken languages, morphologically complex words are formed by adding prefixes or suffixes to a word stem. In ASL and other signed languages, complex forms are most often created by nesting a sign stem within dynamic movement contours and planes in space. Figure 2 illustrates the base form GIVE along with several inflected forms. ASL has many verbal inflections that convey temporal information about the action denoted by the verb, for example, whether the action was habitual, iterative,

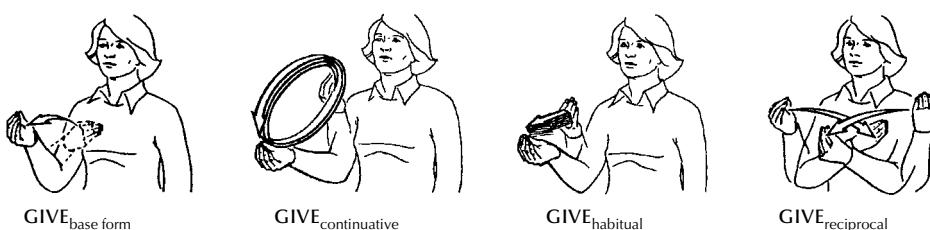


Figure 5.2. Examples of nonconcatenative morphology in ASL.

or continual. Generally, these distinctions are marked by different movement patterns overlaid onto a sign stem. This type of morphological encoding contrasts with the primarily linear affixation found in spoken languages. For spoken languages, simultaneous affixation processes such as templatic morphology (e.g., in the Semitic languages), infixation, or reduplication are relatively rare. Signed languages, by contrast, prefer nonconcatenative processes such as reduplication; and prefixation and suffixation are rare. Sign languages' preference for simultaneously producing affixes and stems may have its origin in the visual-manual modality.

For example, the articulators for speech (the tongue, lips, jaw) can move quite rapidly, producing easily perceived distinctions on the order of every 50–200 milliseconds. In contrast, the major articulators for sign (the hands) move relatively slowly such that the duration of an isolated sign is about 1,000 milliseconds; the duration of an average spoken word is more like 500 milliseconds. If language processing in real time has equal timing constraints for spoken and signed languages, then there is strong pressure for signed languages to express more distinctions simultaneously. The articulatory pressures seem to work in concert with

the differing capacities of the visual and auditory systems for expressing simultaneous versus sequential information. That is, the visual system is well suited for simultaneously perceiving a large amount of information, whereas the auditory system seems particularly adept at perceiving fast temporal distinctions. Thus both sign and speech have exploited the advantages of their respective modalities.

5.1.3 Coreference and Anaphora

Another hypothesized universal use of space within sign languages is for referential functions. In ASL and other sign languages, nominals can be associated with locations in signing space. This association can be established by “indexing” or pointing to a location in space after producing a lexical sign, as shown in Figure 3. Another device for establishing the nominal-locus association is to articulate the nominal sign(s) at a particular location or by eye gaze toward that location. In Figure 3, the nominal DOG is associated with a spatial locus on the signer's left and CAT is associated with a locus on the signer's right. The verb BITE moves between these locations identifying the subject and object of the sentence “[The dog] bites [the cat].” BITE belongs to a subset of ASL verbs

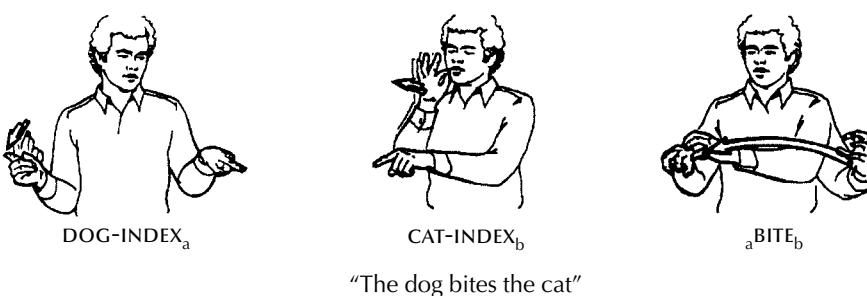


Figure 5.3. Example of the sentential use of space in ASL. Nominals (*cat*, *dog*) are first associated with spatial loci through indexation. The direction of the movement of the verb (*BITE*) indicates the grammatical role of subject and object.

termed *agreeing* verbs, whose movement and/or orientation signal grammatical role.³ ASL pronouns also make use of established associations between nominals and spatial loci. A pronominal sign directed toward a specific locus refers back to the nominal associated with that locus. Further description of coreference and anaphora in ASL can be found in Lillo-Martin (1991) and Padden (1988).

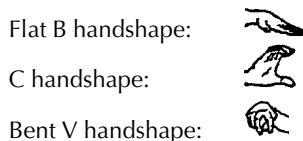
Recently, there has been some controversy within sign linguistics concerning whether space itself performs a syntactic function in ASL. Liddell (1993, 1994, 1995) has argued that spatial loci are not morphemic. He proposes that space in sentences illustrated in Figure 3 is being used deictically rather than anaphorically. That is, the signer deictically points to a locus in the same way he would point to a physically present person. In contrast, other researchers have argued that these spatial loci are agreement morphemes or clitics that are attached to pronouns and verbs (e.g., Janis 1995; Padden 1990). As evidence for his position, Liddell (1993, 1995) argues that just as there is an unlimited number of spatial positions in which a physically present referent could be located, there also appears to be an unlimited number of potential locations within signing space (both vertically and horizontally) toward which a verb or pronominal form can be directed (see also Lillo-Martin and Klima 1990). If this is the case, then location specifications are not listable or categorizable and therefore cannot be agreement morphemes or clitics. The syntactic role of subject or object is assigned, not by the spatial loci, but either by word order or by the orientation or the temporal end points of the verb itself.⁴ According to this view, the particular location at which a verb begins or ends serves to identify the *referent* of the subject and object roles. The space itself, Liddell has argued, is not part of a syntactic rep-

resentation; rather, space is used nonmorphemically and deictically (much as deictic gesture is used when accompanying speech). This hypothesis is quite radical, and many of the details have not been worked out. For example, even if space itself does not perform a syntactic function, it does perform both a referential and a locative function within the language (see Emmorey, Corina, and Bellugi 1995). The association of a nominal with a particular location in space needs to be part of the linguistic representation at some level in order to express coreference relations between a proform and its antecedent. If this association is not part of the linguistic representation, then there must be an extremely intimate mixing of linguistic structure and nonlinguistic representations of space.

5.1.4 Locative Expressions

The spatial positions associated with referents can also convey locative information about the referent. For example, the phrase DOG INDEX, shown in Figure 3 could be interpreted as “the dog is there on my left,” but such an interpretation is not required by the grammar. Under the nonlocative reading, INDEX simply establishes a reference relation between DOG and a spatial locus that happens to be on the signer’s left. To ensure a locative reading, signers may add a specific facial expression (e.g., spread tight lips with eye gaze to the locus), produced simultaneously with the INDEX sign. Furthermore, ASL has a set of classifier forms for conveying specific locative information, which can be embedded in locative and motion predicates; for these predicates, signing space is most often interpreted as corresponding to a physical location in real (or imagined) space. The use of space to directly represent spatial relations stands in marked contrast to spoken languages, in which spatial

information must be recovered from an acoustic signal that does not map onto the information content in a one-to-one correspondence. In locative expressions in ASL, the identity of each object is provided by a lexical sign (e.g., TABLE, T-V, CHAIR); the location of the objects, their orientation, and their spatial relation vis-a-vis one another are indicated by where the appropriate accompanying classifier sign is articulated in the space in front of the signer. The Flat B handshape is the classifier handshape for rectangular, flat-topped, surface-prominent objects like tables or sheets of paper. The C handshape is the classifier handshape for bulky boxlike objects like televisions or microwaves. The Bent V is the classifier handshape for squat, “legged” objects like chairs, small animals, and seated people.



These handshapes occur in verbs that express the spatial relation of one object to another and the manner and direction of motion (for moving objects/people). Figure 4 illustrates an ASL description of the room that is sketched at the far left. An English translation of the ASL description would be “I enter the room; there is a table to my left, a TV on the far side, and a chair to my right.” Where English uses separate words to express such spatial relations, ASL uses the ac-

tual visual layout displayed by the array of classifier signs to express the spatial relations of the objects.

Landau and Jackendoff (1993) have recently argued that languages universally encode very little information about object shape in their locative closed-class vocabulary (e.g., prepositions) compared to the amount of spatial detail they encode in object names (see also Landau, Chapter 8, [original volume]). As one can surmise from our discussion and from Figure 4, ASL appears to have a rich representation of shape in its locative expressions. Like the locational predicates in Tzeltal (Brown 1991; Levinson 1992a), ASL verbs of location incorporate detailed information about the shape of objects. It is unclear whether these languages are counterexamples to Landau and Jackendoff’s claims for two reasons. First, both Tzeltal and ASL express locative information through verbal predicates that form an open-class category, unlike prepositions (although the morphemes that make up these verbal predicates belong to a closed class). The distinction may hinge on whether these forms are considered grammaticalized closed-class elements or not (see also Talmy 1988). Second, in ASL the *degree* of shape detail is less in classifier forms than in object names. For example, the Flat B handshape classifier is used for both TABLE and for PAPER—the count nouns encode more detailed shape information about these objects than the classifier form.

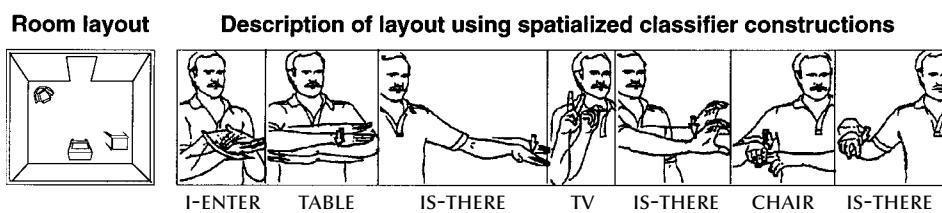


Figure 5.4. Example of an ASL spatial description using classifier constructions.

Thus, although the contrast is much less striking in ASL than in English, it still appears to hold.

Talmy (1983) has proposed several universal features that are associated with the figure object (i.e., the located object) and with the reference object or ground. For example, the figure tends to be smaller and more movable than the ground object. This asymmetry can be seen in the following sentences (from Talmy 1983):⁵

- (1) a. The bike is near the house.
- b. ?The house is near the bike.

In English, the figure occurs first, and the ground is specified by the object of the preposition. When a large unmovable entity such as a house is expressed as the figure, the sentence is semantically odd. This same asymmetry between figure and ground objects occurs in ASL, except that the syntactic order of the figure and ground is reversed compared to English, as shown in (2a) and (2b) (the subscripts indicate locations in space). In these examples, the classifier in the first phrase is held in space (indicated by the extended line) during the articulation of the second phrase (produced with one hand). In this way, the classifier handshape representing the figure can be located with respect to the classifier handshape representing the ground object, as illustrated in Figure 5 (the signer's left hand shows the classifier form for HOUSE; her right hand shows the classifier form for BIKE). The final classifier configuration is the same for either (2a) or (2b)—what differs is phrasal order.

- (2)
 - a. **HOUSE OBJECT-CLASSIFIER_a** _____ **BIKE VEHICLE-CLASSIFIER_b**_{near a}
 - b. ?**BIKE VEHICLE-CLASSIFIER_a** _____ **HOUSE OBJECT-CLASSIFIER_b**_{near a}

Recently, I asked eight native signers⁶ to describe a series of fifty-six pictures depicting simple relations between two objects

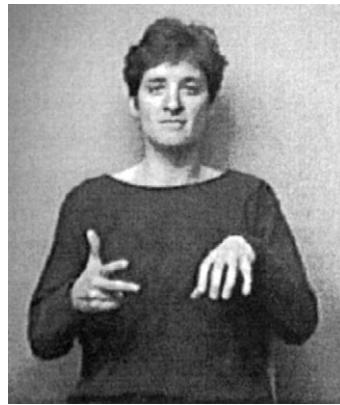


Figure 5.5. Final classifier configuration of either (2a) or (2b).

(e.g., a dog under a chair, a car behind a tree). The signers almost invariably expressed the ground first, and then located the figure with respect to the ground object. This ordering may be an effect of the visual-spatial modality of sign language. For example, to present a scene visually through drawing, the ground tends to be produced first, and then the figure is located within that ground. Thus, when drawing a picture of a cup on a table, one generally would draw the table first and then the cup; rather than draw the cup in midair and then draw the table beneath it.⁷ More crosslinguistic work will help determine whether the visual-spatial modality conditions all signed languages to prefer to initially express the ground and then the figure in locative constructions.

Talmy (1983) also argues that prepositions (for languages like English) ascribe particular geometries to figure and ground objects. He presents evidence that all languages characterize the figure's geometry much more simply than the ground. The figure is often conceived of as a simple point, whereas the ground object can have more complex geometric specifications. For example, Talmy argues that the English



Figure 5.6. Final classifier construction for (3a).



Final classifier construction for (3b).

prepositions *across*, *between*, *along*, and *among* all pick out different ground geometries. At first glance, it appears that there is no such asymmetry in ASL. For example, the classifier construction in (2a) for the ground (the house) does not appear to be more geometrically complex than the figure (the bike) with respect to specifications for shape (indicated by classifier handshape) or for spatial geometry. The locative expression in (2a) does not appear to have a linguistic element that differentially encodes figure and ground geometries in the way that prepositions do in spoken languages. Nonetheless, the grammar of ASL reflects that fact that signers conceive of the figure as a point with respect to a more complex ground. As shown in (3a) and (3b) and illustrated in Figure 6, expression of the figure can be reduced to a point, but expression of the ground cannot:

- (3)
- a. HOUSE OBJECT-CLASSIFIER_a $\frac{\text{BIKE POINT}_{\text{near } a}}{\text{BIKE VEHICLE-CLASSIFIER}_{\text{near } a}}$
 - b. ?HOUSE POINT_a $\frac{\text{BIKE VEHICLE-CLASSIFIER}_{\text{near } a}}{\text{BIKE VEHICLE-CLASSIFIER}_{\text{near } a}}$

Thus Talmy's generalization about figure-ground complexity appears to hold even for languages that can use spatial geometry itself to encode spatial relations.

5.1.5 Frames of Reference

ASL can express spatial relations using an intrinsic, relative, or absolute frame of reference (see Levinson, Chapter 4, [original volume], for discussion of the linguistic and spatial properties of these reference frames).⁸ Within a relative frame of reference, scenes are most often described from the perspective of the person who is signing. In this case, the origin of the coordinate system is the viewpoint of the signer. For example, eight ASL signers were asked to describe the picture shown in Figure 7. All but one indicated that the bowl was on their left with the banana on their right (one signer provided a description of the scene without using signing space in a topographic way, producing the neutral phrase *ON S-I-D-E* instead). To indicate that the banana was on their right, signers produced the classifier form for bowl on the left side of signing space, and then a classifier form for banana was simultaneously articulated on the right.

Descriptions from the addressee's viewpoints⁹ turn out to be more likely in the front-back dimension than in the left-right dimension (the signer's perspective is still the most likely for both dimensions). In describing the picture shown in Figure 8, five

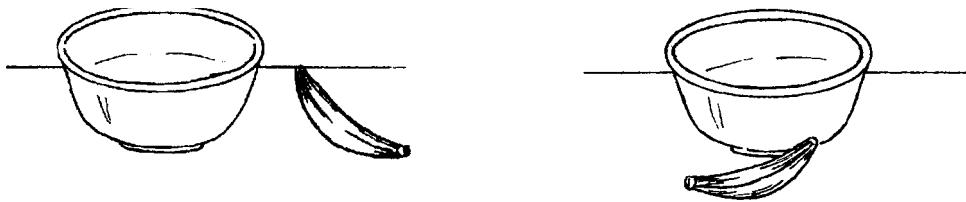


Figure 5.7. Illustration of one of the pictures that signers were asked to describe.

of eight signers preferred their own viewpoint and produced the classifier for banana near the chest with the classifier for bowl articulated away from the chest behind the classifier for banana, as shown in Figure 8a. This spatial configuration of classifier signs maps directly onto the view presented in Figure 8 (remember that you as the reader are facing both the signer and the picture). In contrast, three signers described the picture from the addressee's viewpoint, producing the classifier for bowl near the chest and the classifier for banana in line with the bowl but further out in signing space, as shown in Figure 8b. This configuration would be the spatial arrangement seen by an addressee standing opposite the signer (as you the reader are doing when viewing these figures). There were no overt linguistic cues that indicated which point of view the signer was adopting. However, signers were very consistent in what point of view they adopted. For example, when the signers

were shown the reverse of Figure 8, in which the banana is behind the bowl, all signers reversed their descriptions according to the viewpoint they had selected previously. Note that the lack of an overt marker of point of view, the potential ambiguity, and the consistency within an adopted point of view also occur in English and other spoken languages (see Levelt 1984).

Bananas and bowls do not have intrinsic front/back features, and thus signers could not use an intrinsic frame of reference to describe these pictures. In contrast, cars do have these intrinsic properties, and the classifier form for vehicles encodes intrinsic features: the front of the car is represented roughly by the tips of the index and middle fingers, which are extended. Figures 9 and 10 illustrate ASL constructions using the vehicle classifier, along with the corresponding pictures of a car in different locations with respect to a tree. Again the majority of signers expressed their own view of the



Figure 5.8. a. Signer's viewpoint (5/8 signers).



b. Addressee's viewpoint (3/8 signers).

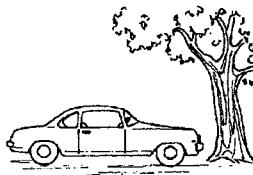


Figure 5.9. a. Signer's viewpoint (6/7 signers).

b. Addressee's viewpoint (1/7).

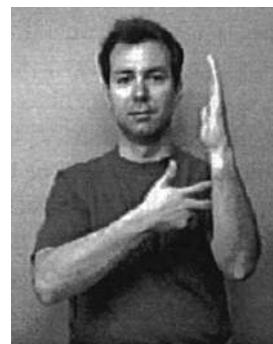


Figure 5.10. a. Signer's viewpoint (5/7 signers).

b. Addressee's viewpoint (2/7 signers).

picture. In Figures 9 and 10, the pictured female signer adopts her own perspective (describing the picture as she sees it), while the male signer adopts the addressee's viewpoint. As noted above, lexical signs identifying the referents of the classifier signs are

given first. Also as noted, the ground object (the tree) is expressed first and generally held in space while the lexical sign for car is articulated and the vehicle classifier is placed with respect to the classifier for tree. The illustrations in Figures 9 and 10 repre-

sent the final classifier construction in the description. As you can see, signers orient the vehicle classifier to indicate the direction the car is facing. Note that the orientation of the car is consistent with the point of view adopted—the vehicle classifier is always oriented toward the tree.¹⁰ The majority of signers described Figure 9 by placing the vehicle classifier to their left in signing space. Only one signer placed the car on his right and the tree on his left. Again all signers were very consistent in which point of view they adopted, although one signer switched from her own viewpoint in describing Figure 9 to the addressee's viewpoint for Figure 10. There were no switches in viewpoint within either the left-right or front-back dimension. Signers were also consistent within the intrinsic frame of reference, almost always changing the orientation of the vehicle classifier appropriately (e.g., toward the left/right or away from/facing the signer).¹¹

One question of interest is whether signers can escape the relative point of view that is imposed “automatically” by the fact that signers (and addressees) view their own articulators in space and these articulators express locative relations using this space. The answer appears to be that a relative framework is not necessarily entailed in locative expressions in ASL. That is, the expressions shown in Figure 9a and 9b could be interpreted as the rough equivalent of “the tree is in front of the car” without reference to the signer's (or addressee's) viewpoint. The car could actually be in any left-right or front-back relation with respect to the signer—what is critical to the intrinsic expression is that the vehicle classifier is oriented toward (facing) the tree. Thus the intrinsic frame of reference is not dependent upon the relative frame; in ASL these two frames of reference can be expressed simultaneously. That is, linguistic expression within an intrinsic

frame occurs via the intrinsic properties of certain classifier forms, and a relative frame can be imposed simultaneously on signing space if a viewpoint is adopted by the signer. Figures 9 and 10 illustrate such simultaneous expression of reference frames. The linguistic and nonlinguistic factors that influence choice of viewpoint within a relative reference frame have not been determined, although it is likely that several different linguistic and nonlinguistic factors are involved. And just as in English (Levelt 1982a, 1984), frame of reference ambiguities can abound in ASL; further research will determine how addressee and signer viewpoints are established, altered, and disambiguated during discourse. Preliminary evidence suggests that, like English speakers (Schober 1993), “solo” ASL signers (such as those in this study) are less explicit about spatial perspective than signers with conversation partners.

Finally, ASL signers can use an absolute reference frame by referring to the cardinal points east, west, north, and south. The signs for these directions are articulated as follows: WEST: W handshape, palm in, hand moves toward left¹²; EAST: E handshape, palm out, hand moves toward right; NORTH: N handshape, hand moves up; SOUTH: S handshape, hand moves down.

- | | |
|--------------|---|
| N handshape: |  |
| E handshape: |  |
| S handshape: |  |
| W handshape: |  |

These signs are articulated in this manner, regardless of where the person is standing, that is, regardless of true west or north. This situation contrasts sharply with how speakers gesture in cultures that employ absolute systems of reference such as certain Aboriginal cultures in Australia (see Levinson

1992b and Chapter 4, [original volume]). In these cultures, directional gestures are articulated toward cardinal points and vary depending upon where the speaker is oriented.

Although the direction of the citation forms of ASL cardinal signs is fixed, the movement of these signs can be changed to label directions within a “map” created in signing space. For example, the following directions were elicited from two signers describing the layout of a town shown on a map (from Taylor and Tversky 1992):

- (4) YOU DRIVE STRAIGHT EAST
 right hand traces E handshape traces the
 a path outward same path, palm to left
 from the signer

“You drive straight eastward.”

- (5) UNDERSTAND MOUNTAIN R-D PATH NORTH
 right hand N handshape
 traces path traces same
 toward left, path, palm in
 near signer near signer

“Understand that Mountain Road goes north in this direction.”

The signer who uttered (5) then shifted the map, such that north was centered outward from the signer, and the sign NORTH¹³ then traced a path similar to the one in (4), that is, centered and outward from the signer. It appears that ASL direction signs are either fixed with respect to the body in their citation form or they are used relative to the space mapped out in front of the signer. As in English, it is the direction words themselves that pick out an absolute framework within which the discourse must be interpreted.

5.1.6 Narrative Perspective

In a narrative, a spatial frame of reference can be associated with a particular character (see discussions of viewpoint in Franklin, Tversky, and Coon 1992; and Tversky, Chapter 12, [original volume]). The frame of reference is relative, and the origin of the

coordinate system is the viewpoint of that character in the story. The linguistic mechanisms used to express point of view in signed languages appear to be more explicit than in spoken languages. Both signers and speakers use linguistic devices to indicate whether utterances should be understood as expressing the point of view of the signer/speaker or of another person. Within narrative, “point of view” can mean either a visual perspective or the nonspatial perspective of a character, namely, that character’s thoughts, words, or feelings. Spoken languages have several different devices for expressing either type of perspective: pronominal deixis (e.g., use of *I* vs. *you*), demonstratives (*here*, *there*), syntactic structure (active vs. passive), and literary styles (e.g., “free indirect” discourse). Signed languages use these mechanisms as well, but in addition, point of view (in either sense) can be marked overtly (and often continuously) by a “referential shift.” Referential shift is expressed by a slight shift in body position and/or changes in eye gaze, head position, or facial expression (for discussions of this complex phenomenon, see Loew 1983; Engberg-Pedersen 1993; Padden 1986; Lillo-Martin 1995; Poulin and Miller 1995).

The following is an example of a referential shift that would require overt marking of a spatial viewpoint. Suppose a signer were telling a story in which a boy and a girl were facing each other, and to the left of the boy was a tall tree. If the signer wanted to indicate that the boy looked up at the tree, he or she could signal a referential shift, indicating that the following sentence(s) should be understood from the perspective of the boy. To do this, the signer would produce the sign LOOK-AT upward and to the left. If the signer then wanted to shift to the perspective of the girl, he or she would produce the sign LOOK-AT and direct it upward and to the

right. Signers often express not only a character's attitudinal perspective, but also that character's spatial viewpoint through signs marked for location and/or deixis. Slobin and Hoiting (1994, p. 14) have noted that "directional deixis plays a key role in signed languages, in that a path verb moves not only with respect to source and goal, but also with respect to sender and receiver, as well as with respect to points that may be established in signing space to indicate the locations and viewpoints of protagonists set up in the discourse." That spoken languages express deixis and path through separate elements (either through two verbs or through a satellite expression and a verb) reflects, they suggest, an inherent limitation of spoken languages. That is, spoken language must linearize deictic and path information, rather than express this information simultaneously, as is easily done in signed languages. Deixis is easily expressed in signed languages because words are articulated in the space surrounding the signer, such that "toward" and "away from" can be encoded simply by the direction of motion with respect to the signer or a referential locus in space. I would further hypothesize that this simultaneous expression of deictic and other locative information within the verbs of signed languages may lead to habitual expression of spatial viewpoint within discourse.

In sum, signed languages use space in several different linguistic domains, including phonological contrast, coreference, and locatives. The visual-gestural modality of signed languages appears to influence the nature of grammatical encoding by compelling signed languages to prefer nonconcatenative morphological processes (see also Emmorey 1995; Supalla 1991; Gee and Goodhart 1988). Signed languages offer important insight into how different frames of reference are specified linguistically.

A unique aspect of the visual-gestural modality may be that intrinsic and relative reference frames can be simultaneously adopted. In addition, shifts in reference are often accompanied by shifts in visual perspective that must be overtly marked on deictic and locative verbs. Although spoken languages also have mechanisms to express deictic and locative relations, what is unique about signed languages is that such relations are directly encoded in space.

5.2 SOME RAMIFICATIONS OF THE DIRECT REPRESENTATION OF SPACE

In the studies reported below, I explore some possible ramifications of the spatial encoding of locative and spatial contrasts for producing spatial descriptions and solving spatial problems. Specifically, I investigate (1) how ASL signers use space to express spatial commands and directions, (2) to what extent signers use lexicalized locatives in spatial directions, (3) whether the use of sign language provides an advantage for certain spatial tasks, and (4) how differences in linguistic encoding between English and ASL affect the nature of spatial commands and directions.

5.2.1 Solving Spatial Puzzles with Spatialized Language

To investigate these questions, ten hearing English speakers and ten deaf ASL native signers were compared using a task in which they had to solve three spatial puzzles by instructing an experimenter,¹⁴ where to place blocks of different colors, shapes, and sizes onto a puzzle grid (see Figure 11). To solve the problem, all blocks must fit within the puzzle outline. The data from English speakers were collected by Mark St. John (1992), and a similar but not identical protocol was used with ASL signers. English

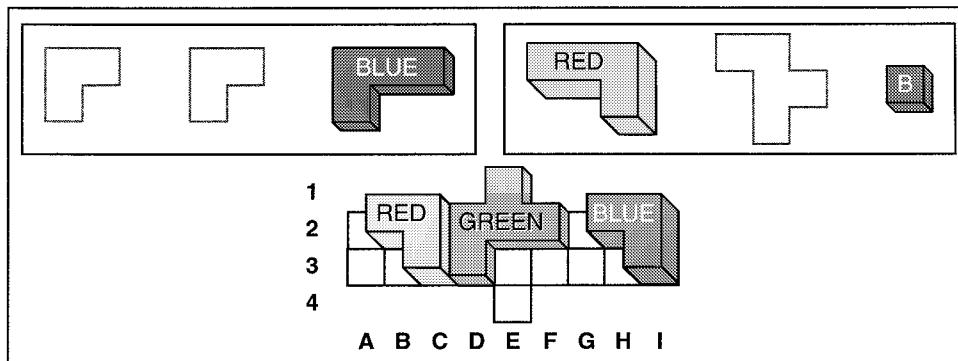


Figure 5.11. Solving a spatial puzzle: Subjects describe how to place blocks on a puzzle grid.

speakers were instructed to sit on their hands and were not permitted to point to the puzzle or to the pieces. Of course, ASL signers could use their hands, but they were also not permitted to point to the pieces or puzzle. For both signers and speakers, the subject and experimenter sat side by side, such that each had the same visual perspective on the puzzle board.

To explore how speakers and signers use spatial language—encoded in either space or sound—we examined different types of English and ASL instructions. We hypothesized that ASL signers may be able to use signing space as a rough Cartesian coordinate system, and therefore would rely less on the coordinates labeled on the puzzle board. This prediction was confirmed: 67% of the English speakers' commands referred to the puzzle grid, whereas only 28% of the commands given by ASL signers referred to the puzzle coordinates. This difference in grid reference was statistically reliable [$F(1,18) = 9.65; p < .01$]. The following are sample commands containing references to the puzzle grid given by English speakers:

- (6) Take the blue L piece and put it on H1 H2 G2.
- (7) Place the red block in 3G H 2G.
- (8) Green piece on E1, E2, D2, C2, and D3.

Instead of referring to grid coordinates, ASL signers used space in various ways to indicate the positions on the puzzle board—for example, by tracing a distinctive part of the board in space or by holding the nondominant hand in space, representing a part of the puzzle board (often an edge).

We also compared how signers and speakers identified the puzzle pieces to be placed for a given command (see Figure 12a). There were no significant differences in how either ASL or English was used to label a particular block. We had hypothesized that signers might make more references to shape because shape is often encoded in classifier handshapes (see discussion above). However, the numerical difference seen in Figure 12a was not statistically significant. Language did not appear to influence how subjects labeled the puzzle pieces within this task.

There were significant differences, however, in the types of commands used by ASL signers and English speakers (see Figure 12b). Puzzle commands could be exhaustively divided into three categories: (1) commands referring to a *position* on the puzzle board, (2) commands expressing a *relation* between two pieces, and (3) the *orientation* of a single piece. These categories were able to account for all of the com-

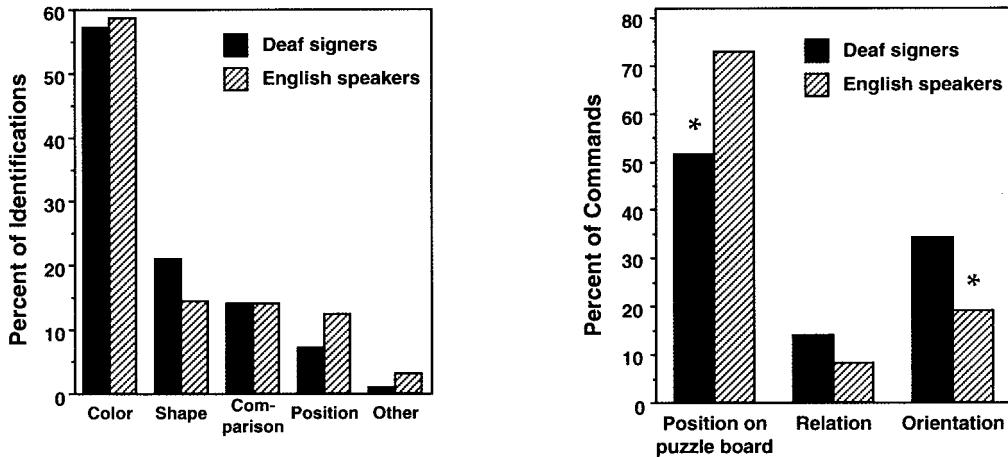


Figure 5.12. a. Type of puzzle piece identification.

b. Type of command reference.

mands given by the twenty subjects. The only difference was that in ASL, two command types could be expressed simultaneously. For example, signers could simultaneously describe the orientation of a piece (through the orientation of a classifier handshape) and that piece's relation to another block through two-handed classifier constructions (see Figure 15, as well as the constructions illustrated in Figures 5, 9, and 10).

English speakers produced significantly more commands referring to a position on the puzzle board compared to ASL signers [$F(1,18) = 4.47; p < .05$]. English speakers' reliance on commands involving coordinate specifications (see examples [6]–[8]) appears to account for this difference in command type. It is interesting to note that even when ASL signers referred to grid coordinates, they often specified these coordinates within a vertical spatial plane, signing the letter coordinates moving crosswise and the number coordinates moving downward. Thus the true horizontal plane of the board laying on the tabletop was "reoriented" into a vertical plane within signing space, as if the puzzle board were set upright. The linguistic and pragmatic constraints on using a

vertical versus horizontal plane to represent spatial layouts are yet to be determined, but clearly use of a vertical plane does not necessarily indicate a true vertical relation between objects. Subjects did not differ significantly in the percentage of commands that referred to the relation of one piece to another. Examples of English relation commands are given in (9)–(11):

- (9) Put the other blue L next to the green one.
- (10) Put it to the left of the green piece.
- (11) Switch the red and the blue blocks.

ASL signers also produced these types of commands, but generally space, rather than prepositional phrases, conveyed the relation between pieces. For example, the nondominant hand can represent one block, and the dominant hand either points to a spatial locus to the left or right (somewhat like the construction illustrated in Figure 6a) or the dominant hand represents another block and is positioned with respect to the non-dominant hand (see Figure 15).

Finally, ASL signers produced significantly more commands that referred to the orientation of a puzzle piece [$F(1, 18) = 5.24; p < .05$]. Examples from English of



GREEN CL:G _____
CL:G-orientation

"Orient the green block in this way." See green block in figure 5.11; note signer's perspective.

Figure 5.13.

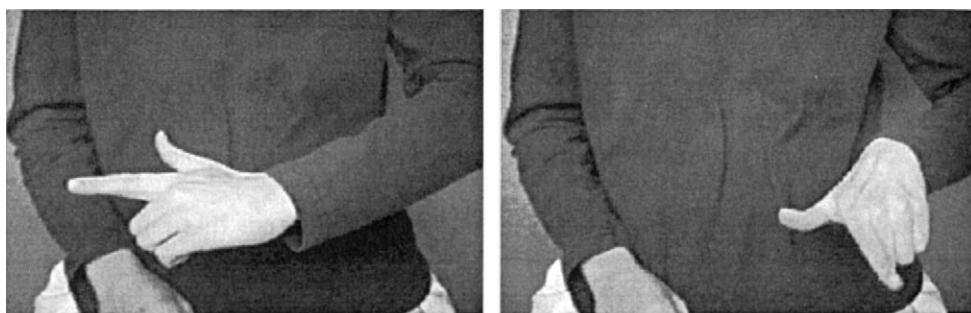
commands referring to orientation are given in (12)–(14):

- (12) Turn the red one counterclockwise.
- (13) Rotate it 90 degrees.
- (14) Flip it back the other way.

For English speakers, a change in orientation was often inferred from where the piece had to fit on the board, given other non-orientation-specific commands. In contrast, ASL signers often overtly specified orientation. For example, Figure 13 illustrates an ASL command that indicates a change in orientation by tracing a block's ultimate orientation in signing space (the vertical plane was often used to trace shape and orientation).

Figure 14 illustrates a command in which orientation change is specified by a change in the orientation of the classifier handshape itself. Figure 15 illustrates the simultaneous production of a command indicating the orientation of an L-shaped piece and its relation to another piece. Signers also used the sign ROTATE quite often and indicated the direction of rotation by movement of the wrist (clockwise vs. counterclockwise).

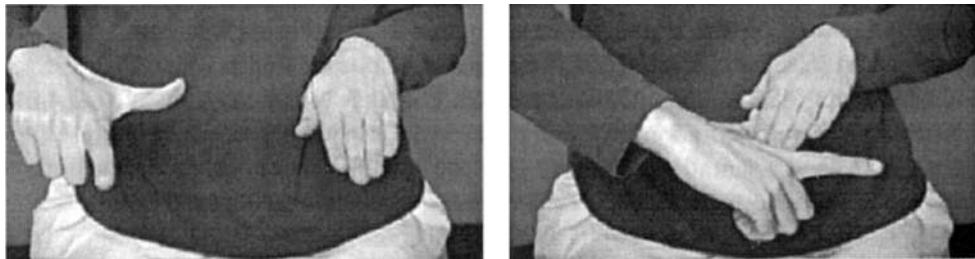
ASL also has a set of lexicalized locative signs that are used much less frequently than classifier constructions in spatial descriptions. The lexicalized locatives that were produced by signers in this study included IN, ON, AGAINST, NEAR, and BETWEEN.



BLUE L CL:L-orientation

"Move the blue L so it is oriented with the long end outward."

Figure 5.14.



RED L CL:B _____
CL:L-orientation
"Move the blue L so it is oriented with the long end outward."

Figure 5.15.

Only about 20% of ASL commands involved lexical locatives, and these were almost always produced in conjunction with commands involving classifier constructions. The grammatical structure of these forms is not well understood—are they adpositions (see McIntire 1980) or verbs (see Shepard-Kegl 1985)—and their semantics has not been well studied either (see McIntire 1980 for some discussion of IN, UNDER, and OUT). The linguistic data from our study provided some interesting insight into the semantics of IN and ON (these signs are shown in Figure 16).

English speakers used the prepositions *in* and *on* interchangeably to specify grid coordinates, for example, “in G2 H2” or “on G2 H2” (see sample commands 6 and 7 above). ASL signers used the lexical locative ON in this context, but never IN:

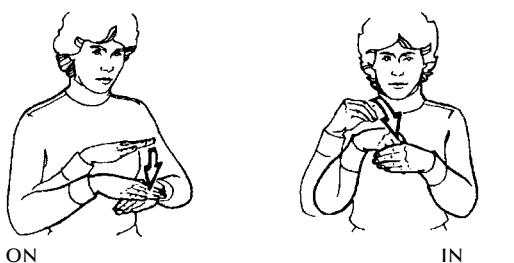


Figure 5.16. ASL lexicalized locative signs.
Illustration by Frank Allen Paul in Newell (1983).

- (15) PUT RED 1 ON G2 H2 I2 I3
- (16) PUT BLUE [CL:G—shape]¹⁵ ON 3E 4F 3F 3G
shape traced in
vertical plane
- (17) *PUT RED 1 IN G2 H2

The use of the preposition *in* for describing grid positions on the puzzle board falls under Herskovitz's (1986) category “spatial entity in area,” namely, “the reference object must be one of several areas arising from a dividing surface” (p. 153). This particular semantic structure does not appear to be available for the ASL sign IN. Signers did use IN when aspects of the puzzle could be construed as container-like (falling under Herskovitz's “spatial entity in a container”). For example, signers would direct pieces to be placed IN CORNER,¹⁶ in this case, two lines meet to form a type of container (see Herskovitz 1986, 149). IN was also used when a block (most often the small blue square) was placed in a “hole” created by other blocks on the board or when a part of a block was inserted into the part of the puzzle grid that stuck out (see Figure 11). In both cases, the reference object forms a type of container into which a block could be placed. The use of the ASL lexical locative IN appears to be more restricted than English *in*, applying only when there is a clear containment relation.

One might conjecture that the iconicity of the sign IN renders its semantics

transparent—one hand represents a container, and the other locates an object within it. However, iconicity can be misleading. For example, the iconic properties of *ON* might lead one to expect that its use depends upon a support relation, with the nondominant hand representing the support object. The data from our experiment, however, are not compatible with this hypothesis. ASL signers used *ON* when placing one block next to and contacting another block (e.g., the red piece *ON* the green in Figure 11):

- (18) RED MOVE [CL:G—*orientation*] ON GREEN
new orientation traced in
horizontal plane

"Move the red one so that it is oriented lengthwise next to the green."

- (19) RED [(CL:G—shape] THAT-ONE ROTATE
shape traced in up- clockwise to
per horizontal plane lower left

[CL:L—*orientation*] ON GREEN

[CL:B—*reference obj.*]

L classifier (right hand)
oriented and positioned with
respect to B classifier (left hand)
as in Figure 5.15

"Rotate that red L-shaped block clockwise so that it is oriented lengthwise at the top of the green."

English speakers never produced commands relating one block to another using only the preposition *on*. Given the nature of the puzzle, subjects never said "put the red block *on* the green one." The support requirements described by Herskovitz for *on* in English do not appear to apply to the lexical locative glossed as *ON* in ASL. This difference in semantic structure highlights the difficulties of transcribing one language using glosses of another (see also discussion in Shepard-Kegl 1985). English *on* is not equivalent in semantics or syntax to ASL *ON* (see Bowerman, Chapter 10, [original volume], for further discussion of language variation and topological concepts).

Finally, the ability to linguistically represent objects and their orientations in space

did not provide signers with an advantage on this complex spatial task. Signers and speakers did not differ in the number of moves required to solve the puzzles nor in the number of commands within a move. In addition, ASL signers and English speakers did not differ significantly in the time they took to solve the puzzles, and both groups appeared to use similar strategies in solving the puzzle. For example, subjects tended to place the most constraining piece first (the green block shown in Figure 11).

In summary, English speakers and ASL signers differed in the nature of the spatial commands that they used for positioning objects. Signers used both vertical and horizontal planes of space itself as a rough Cartesian coordinate system. Changes in object orientation were expressed directly through changes in the spatial position of classifiers and by tracing shape and orientation in signing space. In contrast, English speakers were less likely to overtly express changes in orientation and relied heavily on direct reference to labels for coordinate positions. The heart of this different use of spatial language appears to lie in the properties of the aural-vocal and visual-manual linguistic modalities. For example, in ASL, the hands can directly express orientation by their own orientation in space—such direct representation within the linguistic signal is not available to English speakers. Finally, ASL and English differ in the semantics they assign to lexicalized locatives for the topological concepts *in* and *on*, and the semantic structure of the ASL locatives cannot be extracted from the iconic properties of the forms. In the following study, we further explore the effect modality may exert on the nature of spatial language for both spoken and signed language.

5.2.2 Room Description Study

Eight ASL signers and eight English speakers were asked to describe the layout of ob-

jects in a room to another person ("the manipulator") who had to place the objects (pieces of furniture) in a dollhouse.¹⁷ In order to elicit very specific instructions and to eliminate (or vastly reduce) interchanges, feedback, and interruptions, "the describer" (the person giving the instructions) could not see the manipulator, but the manipulator could see the describer through a one-way mirror (see Figure 17). The manipulator could not ask questions but could request that the describer pause or produce a summary. Subjects described six rooms with canonical placements of furniture ("normal rooms") and six rooms in which the furniture had been strewn about haphazardly without regard to function ("haphazard rooms"). The linguistic data and analysis arising from this study are discussed elsewhere (Emmorey, Clothier, and McCullough). However, certain results emerged from the study that illuminate some ramifications of the direct representation of space for signed languages.

Signers were significantly faster than speakers in describing the rooms [$F(1,14) = 5.00; p < .05$; see Figure 18a]. Mean description time for ASL signers was 2 min, 4 sec; English speakers required an average of 2

min, 48 sec to describe the same rooms. In one way, the speed of the signers' descriptions is quite striking because, on average, ASL signs take twice as long as English words to articulate (Klima and Bellugi 1979; Emmorey and Corina 1990). However, as we have seen thus far in our discussion of spatial language in ASL, there are several modality-specific factors that would lead to efficient spatial descriptions and lessen the need for discourse linearization (Levelt 1982a,b), at least to some degree. For example, the two hands can represent two objects simultaneously through classifier handshapes, and the orientation of the hands can also simultaneously represent the objects' orientation. The position of the hands in space represents the position of the objects with respect to each other. The simultaneous expression of two objects, their position, and their orientation stands in contrast to the linear strings of prepositions and adjunct phrases that must be combined to express the same information in English.

The difference in description time was not due to a speed-accuracy trade-off. Signers and speakers produced equally accurate descriptions, as measured by the percent of furniture placed correctly by the manipulators in each group (see Figure 18b). There

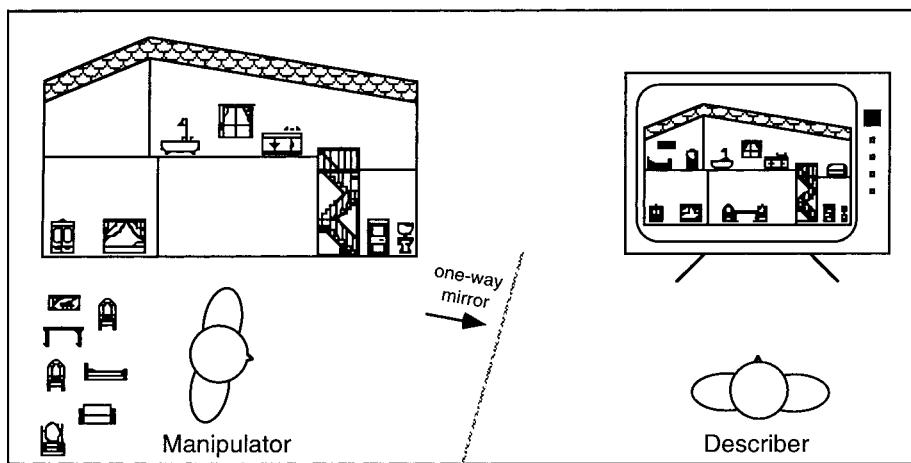


Figure 5.17. Experimental set-up for room descriptions.

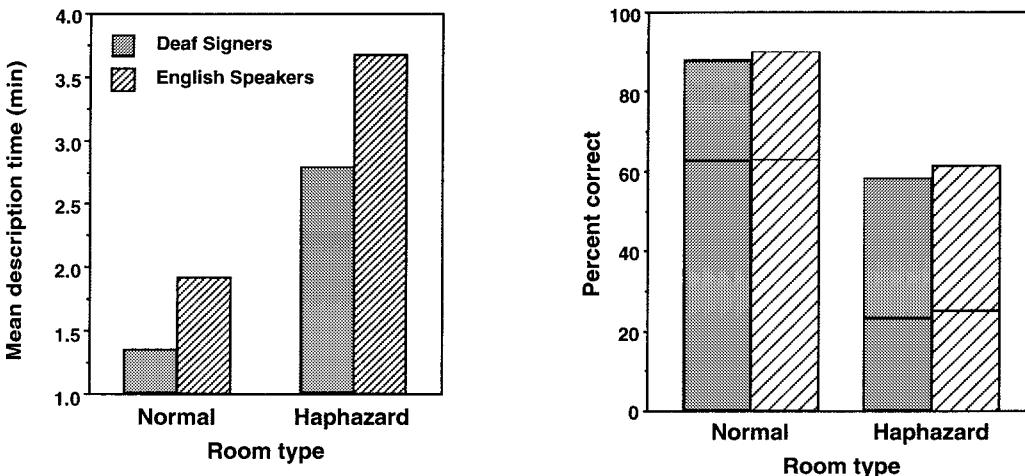


Figure 5.18. a. Dollhouse room description.

b. Accuracy of manipulators.

was no significant difference in percent correct, regardless of whether a lenient scoring measure was used (object misplaced by more than 3 cm or misoriented by 45 degrees; represented by height of the bars in Figure 18b) or a strict scoring measure was used (object misplaced by 1 cm or misoriented by 15 degrees; shown by the line in each bar in Figure 18b).

To summarize, this second study suggests that the spatialization of American Sign Language allows for relatively rapid and efficient expression of spatial relations and locations. In the previous study, we saw that ASL signers and English speakers focused on different aspects of objects within a spatial arrangement, as reflected by differing instructions for the placement of blocks within a coordinate plane. These differences arise, at least in part, from the spatial medium of signed languages, compared to the auditory transmission of spoken languages.

5.3 INTERPLAY BETWEEN SPATIALIZED LANGUAGE AND SPATIAL COGNITION

We now turn to the relation between general nonlinguistic spatial cognition and

processing a visual-spatial linguistic signal. Does knowing a signed language have any impact on nonlinguistic spatial processing? In a recent investigation, Emmorey, Kosslyn, and Bellugi (1993) examined the relation between processing ASL and the use of visual mental imagery. Specifically, we examined the ability of deaf and hearing subjects to mentally rotate images, to generate mental images, and to maintain images in memory (this last skill will not be discussed here). We hypothesized that these imagery abilities are integral to the production and comprehension of ASL and that their constant use may lead to an enhancement of imagery skills within a non-linguistic domain. In order to distinguish the effects of using ASL from the effects of being deaf from birth, we also tested a group of hearing subjects who were born to deaf parents. These subjects learned ASL as their first language and have continued to use ASL in their daily lives. If these hearing native signers have visual-spatial skills similar to those found for deaf signers, this would suggest that differences in spatial cognition arise from the use of a visual-spatial language. On the other hand, if these signers have visual-spatial

skills similar to those found in hearing subjects, this would suggest that differences in spatial cognition may be due to auditory deprivation from birth.

We hypothesized that mental rotation may play a crucial role in sign language processing because of the changes in spatial perspective that can occur during referential shifts in narrative (see above) and the shifts in visual perspective that occur between signer and addressee. As discussed earlier, during sign comprehension the perceiver (i.e., the addressee) often must mentally reverse the spatial arrays created by the signer such that, for example, a spatial locus established on the right of the person signing (and thus on the left of the addressee) is understood as on the right in the scene being described by the signer (see Figures 9a and 10a). Because scenes are most often described from the signer's perspective and not the addressee's, this transformation process may occur frequently. The problem is not unlike that facing understanders of spoken languages who have to keep in mind the directions "left" and "right" with regard to the speaker. The crucial difference for ASL is that these directions are encoded spatially by the signer. The spatial loci used by the signer to depict a scene (e.g., describing the position of objects and people) must therefore be understood as the reverse of what the addressee actually *observes* during discourse (assuming a face to face interaction). Furthermore, in order to understand and process sign, the addressee must perceive the reverse of what they themselves would produce. Anecdotally, hearing subjects have great difficulty with this aspect of learning ASL; they do not easily transform a signer's articulations into the reversal that must be used to produce the signs. Given these linguistic processing requirements, we hypothesized that signers would be better than hearing subjects at mentally rotating imaged

objects and making mirror image judgments. To test this hypothesis, we used a task similar to the one devised by Shepard and Metzler (1971) in which subjects were shown two forms created by juxtaposing cubes to form angular shapes. Subjects were asked to decide whether the two shapes were the same or mirror images, regardless of orientation (see Figure 19).

Our results support the hypothesis that use of ASL can enhance mental rotation skills (see the top illustration in Figure 19); both deaf and hearing signers had faster reaction times compared to nonsigners at all degrees of rotation. Note that the slopes for the angle of rotation did not differ between signing and nonsigning groups, and this indicates that signers do not actually rotate images faster than nonsigning subjects. Emmorey, Kosslyn, and Bellugi (1993) originally suggested that ASL signers may be faster in detecting mirror reversals, particularly because they were faster even when no rotation was required (i.e., at zero degrees). However, recent research by Ilan and Miller (1994)¹⁸ indicates that different processes may be involved when mirror-same judgments are made at zero degrees within a mental rotation experiment, compared to when mental rotation is not required on any of the trials. In addition, preliminary results from Emmorey and Bettger indicate that when native ASL signers and hearing nonsigners are asked to make mirror-same judgments in a comparison task that does not involve mental rotation, these groups do not differ in accuracy or reaction time. The faster response times exhibited by signers on the mental rotation task may reflect faster times to initiate mental rotation or faster times to generate a mental image (as suggested by the next experiment). Finally, the finding that hearing native signers performed like deaf signers indicates that enhancement on this mental rotation task is

Mental rotation task

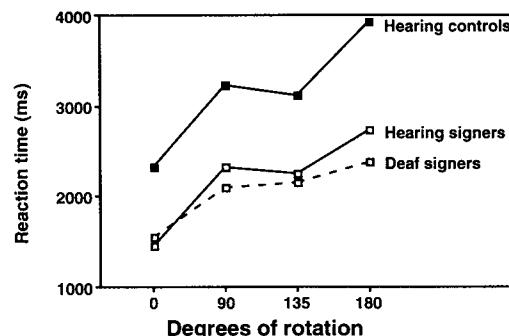
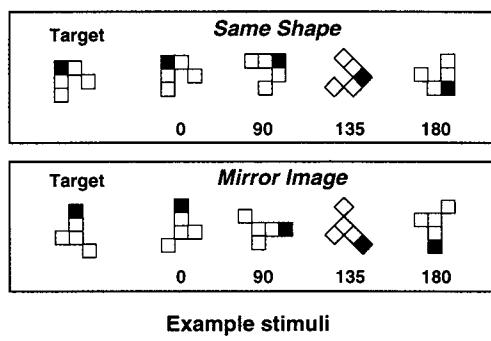


Image generation task

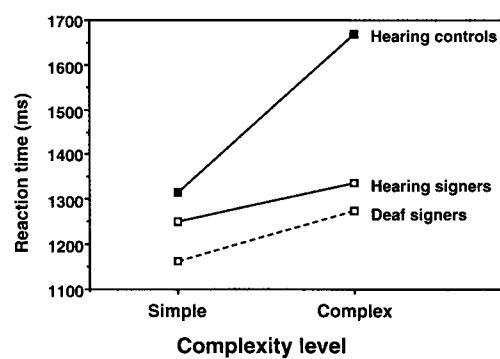
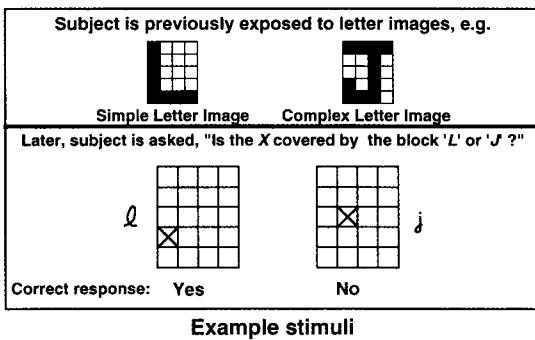


Figure 5.19. Illustration of the mental rotation and image generation tasks used by Emmorey et al. (1993).

not a consequence of auditory deprivation. Rather, it appears to be due to experience with a visual language whose production and interpretation may involve mental rotation (see also Talbot and Haude 1993).

Another visual imagery skill we investigated was the ability to generate mental images, that is, the ability to create an image (i.e., a short-term visual memory representation) on the basis of information stored in long-term memory (see Kosslyn et al. 1985). In ASL, image generation may be an important process underlying aspects of referential shift. Liddell (1990) argues that under referential shift, signers may imagine referents as physically present, and these visualized referents are relevant to the expression of verb agreement morphology. Liddell

gives the following example involving the verb ASK which is lexically specified to be directed at chin height (see Figure 20):

To direct the verb ASK toward an imagined referent, the signer must conceive of the location of the imaginary referent's head. For example, if the signer and addressee were to imagine that Wilt Chamberlain was standing beside them ready to give them advice on playing basketball, the sign ASK would be directed upward toward the imaged height of Wilt Chamberlain's head (Figure [20a]). It would be incorrect to sign the verb at the height of the signer's chin (Figure [20b]). This is exactly the way agreement works when a referent is present. Naturally, if the referent is imagined as laying down, standing on a chair,

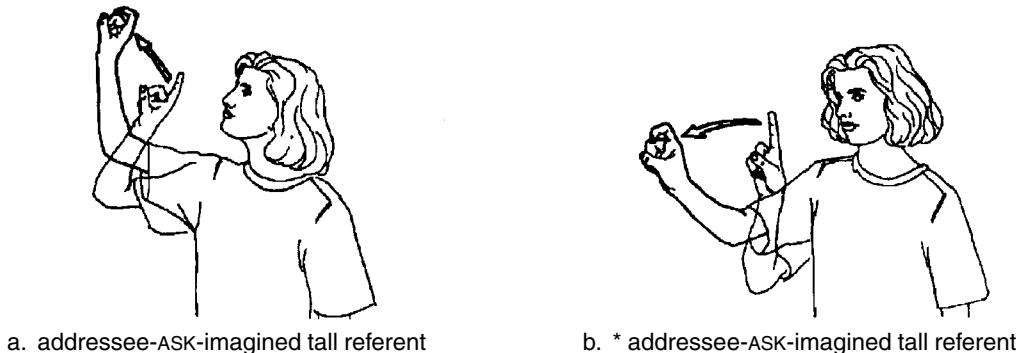


FIGURE 5.20. Agreement verbs and referents imagined as present. Illustration from Liddell (1990).

etc., the height and direction of the agreement verb reflects this. Since the signer must conceptualize the location of body parts of the referent imagined to be present, there is a sense in which an invisible body is present. The signer must conceptualize such a body in order to properly direct agreement verbs. (Liddell 1990, 184)

If deaf subjects are in fact generating visual images prior to or during sign production, then the speed of forming these images would be important, and we might expect signers to develop enhanced abilities to generate images. The image generation task we used is illustrated at the bottom of Figure 19. Subjects first memorized uppercase block letters and then were shown a series of grids (or sets of brackets) that contained an X mark. A lowercase letter preceded each grid, and subjects were asked to decide as quickly as possible whether the corresponding uppercase block letter would cover the X if it were in the grid. The crucial aspect of the experiment was that the probe mark appeared in the grid only 500 ms after the lowercase cue letter was presented. This was not enough time for the subjects to complete forming the letter image; thus response times reflect in part the time to generate the image. Kosslyn and colleagues have used

this task to show that visual mental images are constructed serially from parts (e.g., Kosslyn et al. 1988; Roth and Kosslyn 1988). Subjects tend to generate letter images segment by segment in the same order that the letter is drawn. Therefore, when the probe X is covered by a segment that is generated early (e.g., on the first stroke of the letter F), subjects have faster reaction times, compared to when the probe is located under a late-imaged segment. Crucially, this difference in response time based on probe location is not found when image generation is not involved, that is, when both the probe X and letter (shaded gray) are physically present.

Our results indicated that both deaf and hearing signers formed images of complex letters significantly faster than nonsigners (see Figure 19). This finding suggests that experience with ASL can affect the ability to mentally generate visual images. Results from a perceptual baseline task indicated that this enhancement was due to a difference in image generation ability, rather than to differences in scanning or inspection—signers and nonsigners did not differ in their ability to evaluate probe marks when the shape was physically present. The signing and nonsigning subjects were equally accurate, which suggests that although signers

create complex images faster than nonsigners, both groups generate equally good images. Furthermore, deaf and hearing subjects appeared to image letters in the same way: both groups of subjects required more time and made more errors for probes located on late-imaged segments, and these effects were of comparable magnitude in the two groups. This result indicates that neither group of subjects generated images of letters as complete wholes, and both groups imaged segments in the same order. Again, the finding that hearing signers performed similarly to deaf signers suggests that their enhanced image generation ability is due to experience with ASL, rather than to auditory deprivation.

This research establishes a relation between visual-spatial imagery within linguistic and nonlinguistic domains. Image generation and mental rotation appear to be deeply embedded in using ASL, and these are not processes that must obviously be involved in both visual imagery and ASL perception. Note that these experiments have focused on ASL processing; whether there is a more direct relation in sign language between linguistic *representations* (e.g., conceptual structure, see Jackendoff, Chapter 1, [original volume]) and spatial representations is a topic for future research.

5.4 NEURAL CORRELATES FOR SIGNED AND SPOKEN LANGUAGES

Finally, sign language exhibits properties for which each of the cerebral hemispheres of hearing people shows different predominant functioning. In general, the left hemisphere has been shown to subserve linguistic functions, whereas the right hemisphere is dominant for visual-spatial functions. Given that ASL expresses linguistic functions by manipulating spatial contrasts, what is the brain organization for sign language?

Is sign language controlled by the right hemisphere along with many other visual-spatial functions or does the left hemisphere subserve sign language as it does spoken language? Or is sign language represented equally in both hemispheres of the brain? Howard Poizner, Ursula Bellugi, and Edward Klima have shown that the brain honors the distinction between language and nonlanguage visual-spatial functions (Poizner, Klima, and Bellugi 1987; Bellugi, Poizner, and Klima 1989). Despite the visual-spatial modality of signed languages, linguistic processing occurs primarily within the left hemisphere of deaf signers, whereas the right hemisphere is specialized for nonlinguistic visual-spatial processing in these signers. Poizner, Bellugi, and Klima have shown that damage to the left hemisphere of the brain leads to sign aphasias similar to classic aphasias observed in speaking patients. For example, adult signers with left-hemisphere damage may produce “agrammatic” signing, characterized by a lack of morphological and syntactic markings and often accompanied by halting, effortful signing. An agrammatic signer will produce single-sign utterances that lack the grammatically required inflectional movements and use of space (see discussion above). In contrast, right-hemisphere damage produces impairments of many visual-spatial abilities, but does not produce sign language aphasias. When given tests of sign language comprehension and production (e.g., from the Salk Sign Aphasia Exam; Poizner, Klima, and Bellugi 1987), signers with right-hemisphere damage perform normally, but these same signers show marked impairment on nonlinguistic tests of visual-spatial functions. For example, when given a set of colored blocks and asked to assemble them to match a model (the WAIS blocks test), right-hemisphere-damaged signers have great difficulty and are unable to capture the overall

configuration of the block design. Similar impairments on this task are found with hearing, speaking subjects with right-hemisphere damage.

Poizner, Klima, and Bellugi (1987) also reported that some signing patients with right-hemisphere damage show a selective impairment in their ability to use space to express spatial relations in ASL, for example when describing the layout of furniture in their room or apartment. Their descriptions are not ungrammatical, but they are incorrect when compared to the actual layout of objects. One hypothesis for this dysfunction following right-hemisphere damage is that, unlike spoken language, ASL requires that the cognitive representation of spatial relations be recovered from and instantiated within a spatialized linguistic encoding (i.e., cognitive spatial relations map to space, not to sound). Evidence supporting this hypothesis comes from a bilingual hearing patient with right-hemisphere damage studied by David Corina and colleagues

(Corina et al. 1990; Emmorey, Corina, and Bellugi 1995; Emmorey, Hickok, and Corina 1993). The data from this case suggest that there may be more right-hemisphere involvement when processing spatial information encoded within a linguistic description for signed compared to spoken languages.

The case involves female patient D.N.,¹⁹ a young hearing signer (age 39), bilingual in ASL and English, who was exposed to ASL early in childhood. She underwent surgical evacuation of a right parietal-occipital hematoma and an arteriovenous malformation. Examination of a magnetic resonance imaging (MRI) scan done six months after the surgery revealed a predominantly mesial superior occipital-parietal lesion. The superior parietal lobule was involved, while the inferior parietal lobule was spared, although some of the deep white matter coming from this structure may also be involved. The comparison test between English and ASL spatial commands (see below and Figure 21) was

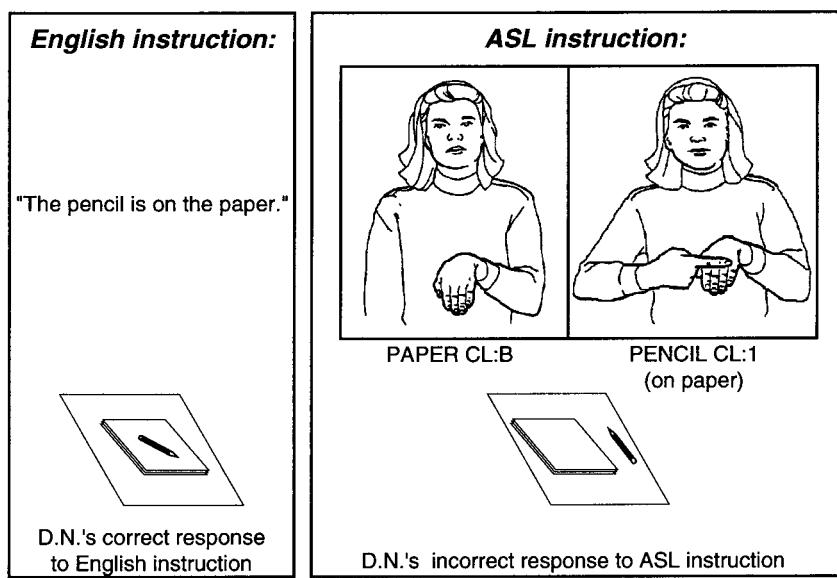


Figure 5.21. Illustration of an RHD patient's differential performance in comprehending English versus ASL spatial commands (the lexical signs PAPER and PENCIL are not shown).

conducted by Corina approximately one year after D.N.'s surgery.

D.N. was not aphasic for either English or ASL. Her performance on the Salk Sign Diagnostic Aphasia Exam was excellent, and she showed no linguistic deficits for English. Nevertheless, she exhibited a striking dissociation between her ability to comprehend and produce spatial descriptions in English compared to ASL. Although her English description had no evident spatial distortions, she was impaired in her ability to describe the spatial layout of her room using ASL. Her ASL description showed a marked disorganization of the elements in the room. Her attempts to place one set of objects in relation to others were particularly impaired, and she incorrectly specified the orientation and location of items of furniture (see also Emmorey, Corina, and Bellugi 1995).

Corina (1989) developed a specific set of tasks to investigate D.N.'s comprehension of locative relations in English and ASL. One of these tasks required D.N. to set up real objects in accordance with spatial descriptions given in either English or in ASL. An example of a simple English instruction would be "The pen is on the paper." The English and ASL instructions along with D.N.'s responses are illustrated in Figure 21. D.N. correctly interprets the English command, but fails with the ASL instructions. This particular example was elicited through informal testing by Corina in which the same instructions were given in both English and ASL. D.N. was later given 36 different spatial commands (18 in English and 18 in ASL) which involved from two to four objects (e.g., cup, pen, book). The instructions were matched for number of spatial relations that were encoded in each language. When D.N. was given instructions in English to locate objects with respect to one another, she performed relatively well—83% correct.

Her score was worse than her normal age-matched bilingual control (100% correct), but better than other right-hemisphere-damaged subjects who were given the English test (69% correct). However, when presented with similar information in ASL—in which spatial relations are presented topographically in sign space—D.N. made many more spatial errors, scoring only 39% correct. This result is particularly striking, given the iconicity of the ASL descriptions (see Figure 21).

We hypothesize that the dissociation between D.N.'s comprehension of English and ASL spatial commands arises because of the highly specific spatial realization of ASL classifier constructions. That is, spatial relations must be recovered from a visual-spatial signal in which much more information is encoded about the relative position and orientation of objects, compared to English. Furthermore, the requirement of reading off spatial relations directly from the orientation and position of classifier signs in space may make additional demands on spatial cognitive processes within the right hemisphere. D.N.'s comprehension impairment is not linguistic *per se*, but stems from the fact that linguistic information about spatial relations must be recovered from a representation that itself is spatialized; D.N. does not have difficulty understanding ASL spatial contrasts that do not encode information about location or orientation. Thus the case of D.N. also bears on our earlier discussion concerning referential versus topographic functions of space in ASL. D.N. exhibits a dissociation between the use of signing space as a linguistic device for marking sentence-level referential distinctions and the use of signing space as a topographic mapping device (see Emmorey et al. 1995 for a complete discussion of this dissociation and for additional evidence from language-processing experiments with normal ASL signers).

In conclusion, signed languages offer a unique window into the relation between language and space. All current evidence indicates that signed languages are constrained by the same principles that shape spoken languages. Thus far, there is no evidence that signed languages grammaticalize different aspects of the spatial world compared to spoken languages (see Supalla 1982). What is different and unusual about signed languages is their visual-spatial form—the fact that space and movement can be used to linguistically represent space and movement in the world. This chapter has explored the ramifications of this spatialized encoding for the nature of linguistic structure, for language processing, for spatial cognition in general, and for the neural substrate of sign language. Future research might include investigations of the following: (1) the semantic and grammatical structure of locative constructions in different sign languages (how do sign languages vary in the way they utilize physical space to represent topological and other spatial concepts?); (2) when and how signing children acquire locative vocabulary (what is the developmental relation between spatial cognition and sign language acquisition? See Mandler, Chapter 9, and Bowerman, Chapter 10, [original volume], for discussion of spatial cognition and spoken language acquisition); (3) spatial attention in sign language perception and nonlinguistic visual-spatial perception (do signers show differences in spatial attention that could be attributed to experience with sign language?); (4) how signers build spatial mental models (does signing space operate like a diagram? See Johnson-Laird, Chapter 11, [original volume]); and (5) the neural substrate and psychological mechanisms that underlie the mapping between a linguistic signal (both signed and spoken) and an amodal spatial representation. These are only some of the

areas in which the study of sign language could enhance our understanding of the relation between language and space.

ACKNOWLEDGMENTS

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NOTES

1. Words in small capital letters represent English glosses for ASL signs. The gloss represents the meaning of the unmarked, unmodulated root form of a sign. A subscripted word following a sign gloss indicates that the sign is made with some regular change in form associated with a systematic change in meaning, and thus indicates grammatical morphology in ASL (e.g., GIVE_{habitual}). Multiword glosses connected by hyphens are used when more than one English word is required to translate a single sign (e.g., LOOK-AT). Subscripts are used to indicate spatial loci; nouns, pronouns, and agreeing verbs are marked with a subscript to indicate the loci at which they are signed (e.g. INDEX_a, BITE_b). Classifier forms are abbreviated CL, followed by the handshape of the classifier and a description of the meaning in italics (CL:G—*shape*). Descriptions of how a classifier sign is articulated may be given underneath the gloss. English translations are provided in quotes.
2. Some signs such as personal pronouns may not be specified in the lexicon for location (see Lillo-Martin and Klima 1990; Liddell 1994).
3. Other terms that have been used for these verbs are *indicating* (Liddell 1995) and *inflecting* (Paden 1988).

4. Whether subject is associated with the beginning or end of the verb's movement depends upon the class of verb (cf. "backwards" verbs, Padden 1988; Brentari 1988).
5. Following traditional linguistic typography, a question mark (?) indicates that a sentence is considered marginal; a star (*) indicates that the sentence is unacceptable.
6. In this study, native signers were deaf individuals who were exposed to ASL from birth.
7. The example of drawing was suggested to me by Dan Slobin, who has made similar arguments about scene setting and the effect of modality on signed languages (Slobin and Hoiting 1994).
8. Sign linguists often use "frame of reference" in a nonspatial sense, referring to anaphoric reference in a discourse (see especially Engberg-Pedersen 1993).
9. The addressee is assumed to be facing the signer. Signers described these pictures to a video camera rather than to an actual addressee. In understanding this discussion of point of view in ASL, it might be useful for you the reader to imagine that you and the signer viewed the display from the same vantage point, and now the signer is facing you (the addressee) to describe it.
10. It should be noted that occasionally a signer may ignore the orientation features of the vehicle classifier, say, pointing the vehicle classifier toward the tree classifier, when in actual fact the car is facing away from the tree. This may occur when it is difficult to produce the correct orientation, say, pointing the vehicle classifier to the right with the right hand, palm out (try it).
11. There were only six examples (out of thirty-five) in which a signer ignored the orientation of the car because it was awkward to articulate. Also, signers did not always alternate which hand produced the classifier for TREE, as might be implied by Figures 9 and 10.
12. Except for the sign LEFT, WEST is perhaps the only sign that is specified as moving toward the signer's left rather than toward the "nondominant side." For both left- and right-handers, the sign WEST moves toward the left, and the sign EAST moves toward the right. The direction of movement is fixed with respect to the signer's left and right, unlike other signs. For example, right- and left-handers would articulate the signs illustrated in Figure 1, which also move across the body, with opposite directions of motion (left to right vs. right to left, respectively). However, there is some change in articulation for left-handers, perhaps due to phonological constraints. For EAST and WEST the orientation of the palm is reversed: outward for WEST and inward for EAST. This change in palm orientation also occurs when a right-handed signer articulates EAST or WEST with the left hand (switches in hand dominance are phonologically and discourse governed).
13. When the signs NORTH and SOUTH are used to label paths within a spatial map, they often retain some of their upward and downward movement.
14. This study was conducted in collaboration with Shannon Casey; the experimenter was either a native speaker of English (for the English subjects) or a deaf ASL signer (for the deaf subjects).
15. This is not an orientation command but a shape description, namely, a classifier construction in which the shape of the blue puzzle piece is traced in the vertical plane (see Figure 13 for an example).
16. CORNER is a frozen classifier construction produced with nominal movement (Supalla and Newport 1978). The sign can be articulated at various positions in space to indicate where the corner is located (e.g., top left or bottom right).
17. This study was conducted with Marci Clothier and Stephen McCullough.
18. I thank Mary Peterson for bringing this work to my attention.
19. Poizner and Kegl (1992) also discuss this patient, but use the pseudonym initials A.S.

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Indicating Verbs and Pronouns: Pointing Away from Agreement

SCOTT K. LIDDELL

During the mid-1970s, while I was a research assistant working with Ed Klima and Ursula Bellugi in their lab at The Salk Institute, it was common for linguists and nonlinguists alike to ask whether American Sign Language (ASL) had a grammar and whether it “qualified” as a real language. Now, more than two decades later, such questions are no longer asked, because the status of ASL as a real language is taken for granted. Some researchers, however, are still reluctant to consider the possibility that ASL discourse might include a significant amount of nonphonologically controlled gestures. This appears to be based on the concern that prior to being recognized as a language, ASL was regarded as merely a collection of gestures—not a language. Talking about gestures in ASL strikes some as a step in the wrong direction.

One of the unique aspects of ASL discourse is the ability of signs to be directed or placed in space. This soon became analyzed as part of what was described as a spatial grammar. This chapter takes issue with the general claim that space is part of the grammatical structure of ASL sentences. I outline an analysis in which the spatial use of signs depends on directing and placing signs with respect to mental representations that are distinct from grammatical representations. It follows from this that directing verbs and pronouns toward elements of such mental

representations is not controlled by phonological features but by the ability to point. This does not amount to a claim that ASL is no longer a language or has no grammar. Rather, it is a claim that some of the aspects of ASL discourse that were thought to be morphemes marking grammatical functions are playing a different role.

From the beginnings of research into the structure of ASL, the space surrounding the signer has been treated as articulatory space. In particular, when the hands move through space to produce signs, this movement has been treated as simply the movements of articulators carrying out phonologically definable articulatory instructions. For example, to produce the sign THINK, the index finger moves to the forehead. To produce the sign MILK, the hand moves to the space several inches ahead of the shoulder as the hand articulates the sign. In producing THINK, the hand reaches a location on the body. In producing MILK, the hand reaches a location in space. There is no theoretical distinction drawn between locations on the body and in space. It is assumed that either type of location is describable in phonological terms. The only difference between the two locations is that one of them is on the body and the other is in space.

But there are other types of signs in ASL. Some signs, such as SEE, appear to point directly at things in the environment. For

Source. Reprinted by permission of the publisher, from K. Emmorey and H. Lane, *The Signs of Language Revisited* (2000): 303–320. Mahway, NJ: Lawrence Erlbaum.

example, directing the sign SEE toward a dog would be understood to mean, “see the dog.” What makes SEE different from THINK and MILK is the fact that the direction the hand takes in producing the sign is not lexically determined. The directionality of the hand depends on the whereabouts of the dog. If the dog is lying down on the signer’s right, the sign will point downward and to the right—toward the dog. Regardless of where around the signer the dog happens to be, the sign will point in that direction. This type of pointing behavior has been treated no differently from the articulatory behavior of the hands in producing signs such as THINK and MILK. Analysts simply propose that, somehow, the grammar extracts the correct phonologically defined location in the space ahead of the signer toward which the hand will move, then the hand moves toward that location just as it would in producing THINK or MILK. In the most recent treatments, the directionality of signs like SEE, whose direction is determined by the locations of actual entities, is considered to be the realization of a grammatical agreement process.

GRAMMATICAL TREATMENTS OF SPACE

In this section, I briefly review proposals in which points in space (spatial loci) are treated as grammatical elements. Each proposal about the grammatical functioning of directional signs is intimately connected with a set of assumptions about the nature of space. I have, where possible, separated claims about the grammatical roles of directional signs from assumptions about the nature of space.

The Nature of Spatial Loci

Table 17.1 summarizes the major claims made about the nature of spatial representations from the beginning of this line of research until the present. Initially, spatial loci were claimed to be pronouns (Woodward 1970). This was followed by the claim that spatial loci were points in space corresponding to indexes of logical structure (Lacy 1974). Later, Klima and Bellugi (1979) proposed that loci are points on a horizontal plane ahead of the signer at about the level

Table 17.1. Representative Claims about Spatial Loci

| Source | Claim About the Nature of Spatial Loci |
|--|---|
| Woodward (1970); Fischer (1975) | Loci are pronouns. |
| Lacy (1974); Kegl (1985); Lillo-Martin and Klima (1990) | Loci are points in space that correspond to indexes of logical structure. |
| Klima and Bellugi (1979) | Loci are points on a horizontal plane that come to be associated with referents. |
| Padden (1988) | Loci are affixes consisting of complexes of phonological features. |
| Liddell and Johnson (1989) | Loci are phonologically describable points in the signing space that serve as places of articulation for signs. |
| Janis (1995) | Loci are either locative or non-locative agreement controllers. |
| Bahan (1996) | Loci are points in space that correspond to complexes of phi features. |

Table 17.2. Representative Claims about the Grammatical Process

| Source | Claim About the Nature of the Grammatical Process |
|--|--|
| Woodward (1970) | Pronouns affixed to verbs |
| Fischer (1975) | Pronouns cliticized to verbs |
| Lacy (1974); Lillo-Martin and Klima (1990) | Indexical inflection |
| Klima and Bellugi (1979) | Deictic verb inflection |
| Padden (1988) | Person agreement on verbs (first, second, and third person) |
| Liddell and Johnson (1989) | Subject and object agreement on verbs |
| Janis (1995) | Locative or nonlocative agreement on verbs |
| Bahan (1996) | Subject and object agreement on verbs (agreement is with phi features—unspecified) |

of the abdomen. Padden (1988) treated spatial loci as affixes consisting of complexes of articulatory features. Liddell and Johnson (1989) proposed a phonological representation system that treats spatial loci as complexes of phonological features. Bahan (1996) treated spatial loci as points in space that correspond to bundles of “phi features.”

We often tend to assume that newer things are better than older ones. This is evident, for example, in software “upgrades” as well as newer model cars. We have the same expectations when it comes to scientific proposals. We expect newer proposals to identify and fix problems with older proposals. If the problems cannot be solved using the older conception, that conception would be discarded in favor of a newer conception capable of solving the problems. In such a scientific tradition, there is some reason to believe that the newer ideas handle the data better than the older ideas. But the history of proposals about space in ASL has not been of this type. In general, new proposals were made almost without regard to the existence of earlier ones. Earlier proposals were not discarded based on scientific merit but were simply ignored. Because earlier proposals have, in general, not been subjected to

scrutiny in the literature, there is no real basis for deciding whether one proposal is superior to any other.¹

The Nature of the Grammatical Process

Claims about the nature of the grammatical processes involved have been as varied as the claims about the nature of space itself. Table 17.2 shows that the claims include affixation, cliticization, deictic verb inflection, indexical inflection, and verb agreement. The claims about the nature of the grammatical processes involved, like claims about the nature of the spatial loci, have not been subjected to scrutiny in the sign language literature. As with claims about the nature of space, what we have is a set of relatively independent claims about the type of grammatical processes that might be involved.

Phonological Implementation

One very interesting aspect of these various proposals about space in ASL has been the

1. There are occasional exceptions to this generalization. Meier (1990), for example, argued against the three-person agreement system proposed by Padden (1988).

Table 17.3. Representative Claims about Phonological Implementation

| Source | Phonological Implementation of the Grammatical Process |
|-------------------------------|--|
| Woodward (1970) | Not described |
| Fischer (1975) | Not described |
| Lacy (1974) | Not described |
| Kegl (1985) | Not described |
| Lillo-Martin and Klima (1990) | Not described |
| Klima and Bellugi (1979) | Not described |
| Padden (1988) | first person = near signer's body second person = in direction of addressee third person = at a locus point i assigned to 3rd person nominal |
| Liddell and Johnson (1989) | Complex set of phonological features indicating vector, height, and distance from the signer |
| Janis (1995) | Not described |
| Bahan (1996) | Not described |

lack of serious attention given to their phonological implementation. That spatial features need to have phonological substance in a grammatical analysis was recognized very early in the history of this issue: “When I refer to ‘distinct phonological forms’ [of pronouns] above I am referring to formalional distinctness in terms of categorical phonological features at the systematic phonemic level” (Lacy 1974, 15). Lacy recognized that a grammatical analysis of space will need a phonological system of representation capable of giving phonological substance to proposed grammatical units. In the early part of this history, the only system of representation available was that originally proposed by Stokoe (1960) and Stokoe, Casterline, and Croneberg (1965). In this representation system, the space ahead of the signer is undifferentiated. Within this system, any sign made in space would be considered to have the same location, transcribed with the symbol \emptyset . Stokoe et al. (1965, x) described this location as “zero, the neutral place where the

hands move [space], in contrast with all places below.”² Regardless of the spatial direction of the sign, it would still be considered to have the same location. So obviously, a lot of work remained to be done in order to implement various types of grammatical proposals concerning space. But in the early days of this research, there was reason to assume that it was simply a matter of time before an appropriate system would be developed. As a result, analysts felt free to propose grammatical analyses without the (customary) need to describe the phonological implementation of the proposal.³ This is apparent in Table 17.3.

2. I have been involved in many discussions where people have talked about “neutral space.” This term evidently developed from Stokoe et al.’s (1965) original description of “the neutral place.”

3. Clearly, in the analysis of spoken languages, no one would seriously consider analyses of affixes, clitics, agreement morphemes, and so forth, unless those proposing the analysis were able to phonologically describe the grammatical element.

In Padden (1988), the directionality of indicating verbs is claimed to reflect subject and object agreement.⁴ The proposed basis for the agreement is the person of the subject or object of the verb. She proposes that ASL has a set of agreement affixes that attach to the verbs, providing them with their directionality. The first-person affix places the sign near signer's body. The second-person affix places the sign in direction of addressee, and the third-person affix places the sign at a locus point assigned to third-person nominal. Although Padden's descriptions attempt to give substance to the proposed affixes, they are not part of a phonological system. This means that these descriptions need to be thought of as narrative descriptions of form rather than as phonological features. Additionally, note that descriptions like "in direction of addressee" could be realized in an unlimited number of ways, depending on the location of the addressee. Thus, even if this description was to be thought of in phonological terms, it doesn't really provide directionality to the hand in linguistic terms, because the location of the addressee is variable.

Liddell and Johnson (1989) developed a phonological representation system for ASL. This system includes a means for segmenting signs into sequences of movements and holds, features for describing hand configurations, as well as the location and orientation of the hands. Within that system, hands move toward locations on the body or in space. For indicating verbs (e.g., SEE, GIVE), the location in space is identified by means of a vector radiating away from the signer, a distance away from the signer on that vector, and a height feature. The system has seven

vectors, four distances away from the signer and potentially, several possible height features. The combinations of vector, distance, and height features result in a very large number of possible locations (*loci*) in the signing space ahead of the signer. Here is how this system was supposed to work. The signer would select the locus that was closest to being "in the direction of" the person or thing present. The sign would then be made at that phonologically definable spatial location. The problem with this system of representation is that signers do not select from a predetermined number of vectors or heights if the person or thing is present. Suppose, for example, that the addressee is not in line with any of the predefined vectors but is closer to one than another. If signers really selected the vector that was nearest to being correct, then we ought to see signers directing signs along those predetermined vectors, even if that meant that the sign is not exactly directed toward the appropriate person or thing. Similarly, the signer would somehow select the height that most closely matched the direction of the entity. But this is not what happens. The system of directing signs is based on directing signs at physically present entities, regardless of where the entity is with respect to the signer.⁵

Summary

Over the past three decades, there have been numerous, relatively independent proposals about signs that use space. The proposals concern the nature of space and the type of grammatical processes exemplified by that use of space. Each proposal carries with it a certain set of assumptions. Although not all

4. This category of verbs has been called "inflecting verbs" (Padden 1988) and "agreement verbs" (Liddell and Johnson 1989). I now use the term "indicating verbs" for reasons that will become apparent.

5. The system of heights ranged from the top of the head to the waist. This range is not adequate to deal with the much greater number of possible heights at which such signs can be produced.

are explicit on this issue, they all share the assumption that some sort of spatial morpheme is somehow attached to the verb. Second, all these proposals assume that such a spatial morpheme can be described by a set of phonological features. No adequate means of giving phonological substance to those proposals currently exists. A third assumption shared by all these proposals is that the space ahead of the signer is part of the grammatical representation of sentences. This is especially apparent when a spatial locus is described as a clitic, a morpheme, or an affix.

AGREEMENT

There is not only disagreement about the nature of agreement as a grammatical process, but there is also disagreement concerning exactly which kind of linguistic phenomena count as examples of agreement (Ferguson and Barlow 1988). To examine claims that the ASL indicating verbs exemplify a grammatical agreement process, we first need a working definition of agreement. Not everyone will accept the following definition, but it will, nevertheless, provide a basis for discussion. If other analysts disagree with this definition, then they can at least be explicit about the definition that guides their analysis. Lehmann (1988, 55) proposed the following definition of agreement:

Constituent B agrees with constituent A (in category C) if and only if the following three conditions hold true:

There is a syntactic or anaphoric relationship between A and B.

A belongs to a subcategory c of a grammatical category C, and A's belonging to C is independent of the presence or the nature of B.

C is expressed on B and forms a constituent with it.

English does not have much in the way of agreement phenomena. However, it is widely accepted that in (1) the verb agrees with the subject of the sentence. The agreement is marked by the suffix -s attached to the verb. In (1) the verb (B) agrees with its subject (A) in person and number. The agreement suffix -s appears only with a third-person singular subject.

- (1) The earth revolves around the sun.

All three conditions described in Lehmann's (1988) definition are met. First, there is a syntactic relation between the subject and the verb. Second, the subject is third-person singular (two subcategories of the person and number categories). These properties of the subject are independent of the presence and nature of the verb. Finally, third-person singular is expressed on the verb by the suffix -s and forms a constituent with it.

ASL “Agreement”

Most recently, authors who have ascribed grammatical functions to indicating verbs in ASL seem to have settled on the idea that indicating verbs reflect grammatical agreement. The most explicit description of the basis for agreement appears in Padden (1988), where the directionality is claimed to be governed by the category “person.” Padden claimed that the agreement categories are first-person, second-person, and third-person. Meier (1990) argued that ASL does not distinguish first-, second-, and third-person forms. Rather, ASL only distinguishes between first-person and non-first-person forms. If person were the basis for agreement, then there should be a first-person form and a non-first-person form.⁶ In-

6. In a three-person system like that proposed by Padden (1988) there would be (not counting allomorphy) three forms. We do not find this either.

stead of two directions corresponding to first- and non-first-person forms, respectively, there is an open-ended number of possible non-first-person forms. This open-ended number of distinctive directional forms is inconsistent with a two-person grammatical system. Other agreement proposals have generally been fairly inexplicit about the basis for agreement.

In (2), agreement analyses would claim that the verb TELL agrees with its object. For purposes of discussion, I will assume that the actual mother is present. In that case, the sign TELL would begin its movement at the chin and then move outward toward the actual mother.

(2) PRO.1 TELL MOTHER.

I told mother

As with the previous English example, to determine whether this is agreement, Lehmann's (1988) three criteria will be tested. There is no problem with the first criterion because theme is a syntactic relation between the verb and its object, MOTHER. The second and third criteria require finding a grammatical property of the object MOTHER being encoded onto the verb. Four common controllers of agreement across languages are person, gender, number, and case (Pulrum 1985). Meier (1990) showed that person is not the basis for the directionality of indicating verbs. Gender does not seem to be an issue in ASL nouns. Even if gender were a property of nouns in ASL, it is clear that ASL does not have an unlimited number of genders corresponding to the unlimited number of possible directions of the verb. Similarly, number is also not controlling the directionality of the verb. Case is unmarked in ASL nouns and could also not account for the directionality of the verb. Any possible agreement analysis will have to identify the property of the object being encoded onto the verb.

It is uncontroversial that the sign TELL points toward the location of the physical mother. But the physical mother is not a constituent of the sentence. In fact, there is no sense in which the actual mother is a part of (2). If sentences contained the actual things being discussed, then (3) would contain a lot of salt water. The point, of course, is that although (2) mentions the mother, she is not part of the sentence.

(3) I love the Atlantic Ocean.

Recall that Lehmann's (1988) definition restricts agreement to two constituents of a sentence. In (2), the two constituents are the verb TELL and the object MOTHER. There are no properties of the sign MOTHER being marked on the verb TELL. Thus, there is no basis for saying that the verb agrees with its object. The directionality of the verb, however, is highly significant because the hand is directed toward the actual mother being talked about. Because the actual mother is not part of the sentence, it does not make sense to say that the verb "agrees" with the actual mother. In addition, as discussed earlier, no one has been able to successfully propose a phonological system capable of describing the unlimited directionality of indicating verbs. Thus, there is no grammatical basis for an agreement analysis and no existing phonological system capable of implementing an agreement analysis.

INDICATING VERBS, PRONOUNS, AND PRESENT REFERENTS

Indicating Verbs

In (2) [PRO.1 TELL MOTHER], the sign TELL begins with the index finger in contact with the chin. The hand then moves outward toward the actual mother and ends with the index finger pointing at the mother. The directionality of the sign TELL in this example is crucial. Without it, signers would judge

the signing to be incorrect.⁷ Clearly, then, the directionality of indicating verbs is highly significant. The question remains, however, as to the role of this directionality.

In human languages, sentences mention things. For example, (4) uses the meaningful phrase, *the turquoise ring* to talk about a ring. Any English speaker could use the same phrase to talk about a different ring. That is, the phrase *the turquoise ring* encodes a description of an entity, but does not encode the actual entity in the world being talked about. The actual entity being talked about is dependent on who uses the phrase and under what conditions. This point is central to the development of mental space theory (Fauconnier 1985, 1997).

- (4) I just bought the turquoise ring.

Of all the possible turquoise rings in the world, how is the addressee to know which ring the speaker has in mind? The definite article *the* helps narrow down the possibilities. The definite article is used when the entity being talked about is known to both the speaker and addressee. This greatly simplifies the addressee's task because now the addressee needs only to consider turquoise rings that are known to both participants in the discourse. If the addressee recalls a shopping trip the day before in which both looked at a turquoise ring, then the addressee now has a basis for deciding which ring is being discussed.

7. I purposely avoided using the term *ungrammatical* here, because that term is generally reserved for improperly constructed combinations of grammatical units. Here, I am claiming that the syntax is fine but that a required deictic gesture is missing. The lack of a required gesture would make this example incorrect. It is not difficult to find parallel examples from spoken language. Without a gesture, and while maintaining eye contact with the addressee, it would be equally incorrect for a man to talk about the shoes he is wearing by saying, "These shoes are very expensive." This would be true even if the shoes being worn by the speaker were the only shoes in sight.

An addressee is constantly faced with the task of making connections between the meanings encoded by words, phrases, and clauses and the real or hypothetical entities described or mentioned in the grammatical representation. If the entity is physically present, speakers typically assist the addressee in making the connection by producing a deictic gesture toward the entity. While producing (5) through (7), for example, the speaker would be expected to either produce a deictic gesture or to show, in some other way, the addressee which entity is being talked about.

- (5) Sign your name right here.
(6) I'll take one of those.
(7) This is my favorite pen.

While uttering (5), the speaker would typically make a pointing gesture toward the place where the signature is expected. It is also frequent to see the speaker write a mark on the piece of paper where the signature is expected while uttering a statement like (5). Similarly, while uttering (6), the speaker would be expected to produce a pointing gesture toward the desired entity. The types of gestures that could accompany (7) might be more varied. In addition to a pointing gesture, the speaker could also, for example, simply lift the pen into the air. Lifting the pen into the air is not a pointing gesture, but it accomplishes the same end by making the pen prominent. In other words, it identifies the pen as the entity in the world that corresponds to the spoken description.

I assume that giving prominence to a physically present entity being talked about is a general characteristic of human discourse. This can be done in a number of ways, but the most typical is a deictic gesture of some sort. Making the entity prominent appears to be a signal to the addressee that the entity corresponds to something in the verbal description. I assume further that the

purpose of giving that prominence is to allow the addressee to make a connection between the semantic structure of the utterance and the present entity. The addressee is constantly faced with making connections between semantic representations and real or hypothetical entities (Fauconnier 1985, 1997). Giving prominence to physically present entities simplifies the addressee's ongoing task. Given this set of assumptions, we can now return to the previous example of an indicating verb, repeated here for convenience.

(2) PRO.1 TELL MOTHER.

I told mother

Langacker (1987, 1991) provided a means of talking about semantic structures within the theory of cognitive grammar. The semantic structure of the verb TELL includes not only a representation of the act of telling but in addition, two schematically represented participants. That is, a prototypical act of telling involves an entity to do the telling and an entity toward which the telling is directed. For this verb, the entity within the semantic representation conceived of as performing the action would be called the *trajectory* and the entity within the semantic representation conceived of as receiving the information would be called the *landmark*. In the semantic representation of the verb TELL, both the trajector and landmark are unelaborated entities.

By grammatically combining the verb TELL with its object MOTHER, the signer overtly encodes that the landmark has the semantic property "mother." In Langacker's terms, the object MOTHER elaborates the landmark of the verb TELL. As a result of the grammatical combination of TELL and MOTHER, the landmark has gone from an unelaborated entity to an entity with the property "mother." There are billions of people and animals on earth with the property

"mother." Thus, even though the landmark has been elaborated with the semantic property "mother," the addressee still has the task of associating the landmark with some real or hypothetical entity. In the analysis proposed here, I claim that the directionality of the sign TELL indicates the entity to be correlated with the verb's landmark. By observing the directionality of the sign TELL, the addressee can see who was told. It is simply a matter of observing the entity toward which the sign points.

Recall that the landmark is a semantic entity that is part of the semantic structure of the verb. In the case of TELL, the landmark is the recipient of the information being conveyed in the act of telling. In (2), the addressee comes to know two things about the landmark of the verb TELL. As a result of the grammatical encoding accomplished by the verb-object construction, the addressee learns that the landmark has the property "mother." As a result of the indicating nature of the verb (e.g., it points at the actual mother), the addressee comes to know the entity in the real world that corresponds to the landmark. Mapping the concept "mother" onto the landmark is grammatically encoded, whereas mapping the actual mother onto the landmark is indicated by means of a deictic gesture.⁸

Pronouns

For the purposes of this discussion, I look only at the singular, non-first-person pronoun, which I call PRO. It is made with a "1" handshape, with the palm facing to the side. The hand typically makes a small outward movement followed by a hold. Semantically, the pronoun encodes a single entity, unspecified for animatedness, gender, or case.

8. I am using the term *mapping* in the sense developed in Fauconnier (1997).

Regardless of the language used, addressees are faced with associating pronouns with real or hypothetical entities. If the entity is present, English speakers could identify it by producing a deictic gesture toward it. In (8), for example, the speaker would have several options for identifying the person corresponding to the pronoun *he*, including pointing with the index finger, a tilt of the head, facing and gazing at the person, and so forth. Regardless of the form of the deictic gesture, if the gesture points toward the referent, the identity of the referent will be apparent to the addressee.

- (8) He did it.

In ASL discourse, addressees also have the ongoing task of associating pronouns with real or hypothetical entities. They are greatly assisted in this task by the requirement that PRO point at its referent, if present. Note that the directionality of PRO performs the same discourse function as the directionality of indicating verbs. In both cases, the pointing helps the addressee make a connection between an entity within a semantic representation and an entity in the immediate environment of the signer.

I know of no viable alternative to this analysis when the entities being talked about are present. That is, all the analyses discussed previously involve associating an entity with a locus in space. For example, Lillo Martin and Klima (1990) proposed that when the entity is present, the signer selects a “referential locus” between the signer and the entity and directs signs toward that locus. The basic problem with the claim that signs are directed toward a locus when the entity is present is that when signs are directed toward a physically present person, each sign has a body part toward which it is directed. The body parts include the forehead, nose, chin or neck, chest, and abdomen. A sign like GET-SAME-IDEA-SAME-TIME is directed toward the forehead. SAY-NO is directed to-

ward the nose, or slightly below. GIVE is directed toward the chest, and INVITE is directed toward the abdomen. These facts about signing are simply inconsistent with the notion that signs are directed toward a referential locus. That is, a locus that might be right for GET-SAME-IDEA-SAME-TIME would be wrong for SAY-NO, GIVE, and INVITE. As a result, it appears to me that even supporters of a grammatical analysis of space will have to grant that when the actual entity is present, signs simply point at the entity.

INDICATING VERBS, PRONOUNS, AND ABSENT REFERENTS

When the entities being discussed are not physically present, both indicating verbs and pronouns still point. In fact, most of the claims about spatial loci in Table 17.1 concern missing referents. The idea is that a point in space, generally referred to as a locus, becomes associated with the missing referent. The claims, in general, have been that signs are then directed toward these loci. I have argued that this type of association is not necessarily with a point in space but with a three-dimensional volume of space. I referred to such spatial entities as “tokens” (Liddell, 1994). Tokens can range in size from essentially a point to something greater than a foot tall. The distinction between locus and token arises because once a spatial association is made with an entity, signs are not, as a rule, directed toward a point in space (Liddell, 1994). Rather, if the token represents a standing human, some signs will be produced at the height of the abdomen, others at the level of the chest, and so on, up to about the level of the nose.⁹ I cannot conceive of a way that the claim that a sign is directed toward a single locus when

9. If the token represents a human lying down, then the token will not have the same height described in the text. See Liddell (1994) for a more complete discussion of this issue.

the entity being talked about is not present can accommodate these facts about signing.

In addition, signers can also conceive of nonpresent entities (people or things) as if the actual entity were present. Such a conceptually present entity is called a surrogate (Liddell, 1995). For example, if a person is conceived of as present, then the signer can direct signs toward that conceptually present person just as if that person were really present. In contrast to a token, a surrogate has the form expected of the actual entity. That is, a surrogate person would have the appropriate size and shape of the actual person. Signers direct signs toward surrogates and interact with surrogates, just as if they were physically present.

I claimed earlier that if the actual entity being talked about is physically present, indicating verbs and pronouns will be directed toward the actual entity. When the actual entity is not present, tokens and surrogates function as conceptually present referents.¹⁰ Understanding that tokens and surrogates are conceptually present entities allows the behavior of indicating verbs and pronouns to be described in a unified way. Indicating verbs and pronouns both point at things. The things they point at are meant to be connected with entities within semantic representations. In the case of the indicating verb TELL, the pointing identifies the thing to be connected with the verb's landmark. In the case of the pronoun PRO, the pointing identifies the entity to be associated with the pronoun's semantic representation.¹¹

10. This chapter does not address the nature of the spatial representations. I have claimed elsewhere that spatial representations in ASL are examples of mental spaces. Signers either direct signs toward entities in Real Space or to entities in blends with Real Space (Liddell, 1998, *in press*; Liddell and Metzger, 1998).

11. This entity is typically called the "referent" of the pronoun. The concept of a referent is clearer when the entity is present. If the physical entity is absent, but there is a conceptually present entity associated with the physical entity, then it is no longer as clear which of the two is the pronoun's referent.

If the thing is physically present, then the verb or pronoun points at it. If the thing is conceived of as present, either in the form of a token or surrogate, then an indicating verb or pronoun will be directed toward that conceptually present entity. The function of the pointing is the same regardless of whether the entity being talked about is physically or conceptually present. In both cases, the pointing identifies a thing to be associated with a part of the semantic representation.

CONCLUSION

I claimed that when the entities being talked about are present, indicating verbs and pronouns are simply directed toward them. If the entity is a person, signs are directed toward specific body parts. This strongly argues against spatial loci being the targets of the movement when the actual entity is present. Suppose the entity in question is not present. Proposals claiming that spatial loci have grammatical status and that directing signs toward such spatial loci reflects a grammatical process suffer from a number of shortcomings. First, they assume without argument that spatial loci have grammatical status. Second, in general, they claim that a grammatical process is involved without being explicit about the nature of the process. Where the basis for agreement is made explicit (Padden, 1988), it has been shown to be inadequate. Third, even assuming that the assumptions about space were correct and that a grammatical process could really be demonstrated, these proposals lack a phonological means of implementing the proposals. Finally, supporters of a grammatical analysis would apparently have to claim that indicating verbs and pronouns behave in two completely different ways. If the entity is present, the sign is directed toward the entity through nonphonological means. If the entity is not present, the sign points at a

spatial locus by means of phonological features — even though no such features exist.

My proposal is that indicating verbs and pronouns simply point at entities. The purpose of the pointing is to allow the addressee to make an association between the entity and the semantic representation of the verb or pronoun. The means by which the sign points is not phonological. Rather, the sign points because the signer knows where the entity is and knows how to point. This analysis applies to both physically and conceptually present entities.

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Body Partitioning and Real-Space Blends

PAUL G. DUDIS*

1 INTRODUCTION

Investigators applying the theory of conceptual blending (Fauconnier and Turner 1996) to American Sign Language (ASL) are interested in real-space blends produced in everyday discourse (Liddell 1998, 2003; Dudis 2002). One type of real-space blend involves the projection of the signer's body into the blend, producing a visible blended element, typically a human [actor].¹ For example, in describing the act of motorcycling uphill, the signer may create a real-space blend in which much of his body is understood to be a [motorcyclist] (this blending process is detailed in the next section). Unlike the other elements in the blend, such as the [motorcycle] and the [hill], the [motorcyclist] is visible. The source of the difference is whether an input element's counterpart in real space involves a portion of the signer's body or only empty physical space. Figure 1 shows the body configuration of the signer. In the blend, the facial expression, the eye gaze, the position of the torso, the outward arms and the hands are all understood to be those of the [motorcyclist].

Such real-space blends are a staple of ASL discourse. One of the main purposes of this type of blend is to produce rich and vivid demonstrations. However, this characterization seems to apply only to the actions of the visible [actor] and what can be inferred from such actions. In the blend in Figure 1, the

signer's body contributes a great deal of information about the [motorcyclist]—the way he moves, his facial expression, how he responds to events, and so forth. In contrast, information about the [motorcycle] or the [hill] cannot be obtained directly from the blend. Information about these non-visible elements can either be inferred from the actions of the [motorcyclist] (e.g., the slope of the hill can be inferred in part from the [motorcyclist's] eye gaze) or obtained from prior discourse. Thus much of the richness and vividness of this blend is both directly and indirectly accessible from the visible element.

Would the blend be richer if additional visible elements were introduced? Is it possible to create more visible elements without recourse to immediately available physical objects such as pencils or cups that could serve as props to one's discourse? The multiple, simultaneous blends examined in Liddell (2000, 2003) and Dudis (2002) address these questions. As an illustration, consider how the signer can effortlessly produce other visible elements in addition to the [motorcyclist]. While keeping the motorcyclist blend active, the signer produces a two-handed verb that depicts the action of a vehicle on a surface.² Production of such verbs establishes a second blend (Liddell 2000), and within this blend the manual articulators map with other input counterparts to result in visible elements. The Flat B handshape

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Figure 1. The signer as visible element |motorcyclist|



Figure 2. The |motorcyclist|, the |motorcycle₂|, and |part of the hill|

shown in Figure 2 is understood to be a part of the surface of the |hill|, upon which the 3 handshape, which is understood to be the |motorcycle|, is moving.³

With this production of multiple real-space blends, addressees have visual access to three distinct elements. In the motorcyclist blend, much of the |motorcyclist| remains accessible despite its decreased visibility with the subsequent production of the depicting verb. In the motorcycle and hill blend, addressees are given direct information from the two visible elements within, such as the slope of the |hill| and the path movement of the |motorcycle|. Thus the two real-space blends create a more explicit description of the act of motorcycling uphill.

The real-space blends described above illustrate two different results of blending involving the signer's body. The first example of the |motorcyclist| has the signer's body projected as a single visible real-space element into the blend. The second example, in which a multiple blend emerges, involves different parts of the signer's body projected as separate visible real-space elements into their respective blends. Body parts demonstrating this ability to be partitioned off are *partitionable zones*. This article examines the use of these zones, illustrating how their existence allows for the creative potential of signers during creation of real-space blends.

2 REAL-SPACE BLENDS

This section reviews how real-space blends of the type described above are produced. In Fauconnier and Turner's (1996, 1998) model of the basic conceptual integration network, four interconnected mental spaces are involved in the blending process. Two of these mental spaces serve as inputs to another mental space, the blend. In the blends examined in this article, one of the inputs is real space which, as Liddell (1995: 21–23) describes, is a mental space built via perceptual processes. This is distinct from the other input in that elements in the former are understood by the conceptualizer as being part of his or her immediate environment; Liddell (1995) uses the term "grounded" to label this particular property of real space. In signed discourse, the real space of the addressee would consist of her conceptualization of the signer via visual input. That is, the signer in the addressee's real space is a mental space element. Other objects that are visually accessible are also potentially real-space elements. The empty physical space is also a real-space element.

The other input is a non-grounded mental space. For convenience, in the examples analyzed in this article, I consider this input to be a narrative space, containing elements introduced during a narrative.⁴ For instance, prior to the blending examples above, the signer may establish a narrative space by indicating to the addressee that he is going to talk about an incident involving the act of motorcycling uphill. Mental spaces are structured by frames and contain elements and relations between elements (Fauconnier 1994, 1997). This particular narrative space is structured by the “motorcycling” frame and contains the elements *motorcyclist*, *motorcycle* and *ground* (the surface of the hill) as well as relations between them. The fourth mental space of the blend network is a generic space, which serves to enable counterpart connections between the input spaces (Fauconnier and Turner 1998). This generic space itself holds elements and relations abstracted away from each of the inputs, such as a *mover* from both *motorcyclist* and the real-space signer and the [MOVE] relation in which the *mover* has a role.⁵

Table 1 lists elements of the motorcyclist blend. The real-space signer and the base (narrative) space element *motorcyclist* are projected into the blend and a distinct element |motorcyclist| is created. As with the other elements in the blend, the |motorcyclist| is a unique conceptual element, distinct in this way from the signer or the *motorcyclist*. The |motorcyclist| is visible, unlike the other elements of the blend, because it inherits this property from the visible real-space signer.

Table 1. Mappings involved in the motorcyclist blend

| Real space input | Base space input | Blended space | Generic space |
|------------------|---------------------|---------------|---------------|
| signer | <i>motorcyclist</i> | motorcyclist | mover |
| space m | <i>motorcycle</i> | motorcycle | moved |
| space h | <i>hill</i> | hill | location |

The |motorcycle| and the |hill| are non-visible because of the properties of counterpart empty physical spaces that are projected into the blend (space “m” and space “h” are just convenient, nonce labels for these areas of physical space). The non-visible blend elements are nevertheless understood to be as conceptually present as the |motorcyclist|.

In short, this real-space blend consists of a visible |actor| and some non-visible |elements| which inherit various properties from their input space counterparts. In the interest of understanding potential qualities and uses of real-space blends, it is worth mentioning that across discourse goals/functions, the degree to which real-space blends are informative can vary, for example regarding the kind of blend, depth of detail, etc. A demonstration for the purposes of instructing may contain less information than a demonstration for narrative purposes. To instruct someone how to open the hood of a car, for example, the signer need not be concerned about the level of detail which includes how the body would need to be positioned in order to reach the lever opening the hood. The narrative version would have more attention to detail, including the body’s navigation as the person reaches for the lever as well as the facial expression worn during the act. The blending process underlying the instructive and narrative instances is similar, but the results are different.

One way the amount of information accessible from the real-space blends is increased is related to the ability of the signer to create distinct visible blend elements. As I

show below, the creation of these elements depends not only on the blending process but also on the existence of partitionable zones of the body. The following sections address the parts of the body observed to be partitionable and the types of contributions they make to the conceptual integration network within single or multiple real-space blends.

3 MANUAL ARTICULATORS AS PARTITIONABLE ZONES

In the motorcyclist blend discussed in section 1, we have seen one example of a partitionable zone of the body being recruited to create a new visible blend element subsequent to one that had already been created. To frame the discussion, a few additional comments are made here regarding the motorcyclist blend.

Generally, the purpose of the motorcyclist blend, in which the only visible element is the |motorcyclist|, is to demonstrate the act of motorcycling uphill. It is possible to simply run this blend until the |motorcyclist| arrives at the top of the hill without needing to establish another blend. The addressee can infer from the |motorcyclist's| actions that the entire act has been initiated and completed, that is, the |motorcyclist| is understood to have traveled from the bottom of the hill to the top. The cues that allow the addressee to make this interpretation include the movement of the |motorcyclist's| hands and torso. As shown in Figure 1, the position of the signer's upper torso is similar to, and an adequate representation of, a motorcyclist's torso position when ascending an actual hill. To indicate that the top has been reached, the signer could move both the torso and the hands, which are understood to be the |motorcyclist's| hands gripping the handles of the |motorcycle|, slightly forward. This physical change would be understood as the normal way a motorcyclist's physical

exertion changes when arriving at the crest of a hill. Other cues include eye gaze behavior and facial expressions. When reaching the top of the |hill|, the |motorcyclist's| eye gaze would no longer be directed upward. The facial expression would change from one of effort during the climb to one of relative relaxation, having completed the somewhat intense act of motorcycling uphill.

In the motorcyclist blend, the movement of the |motorcycle| is not directly shown, but is inferred from the actions of the |motorcyclist|. However, the signer can choose to demonstrate the vehicle's movement explicitly by creating a distinct visible element that is understood to be the |motorcycle|. This choice is available because of the existence of a particular body part that can be partitioned off from its role in the motorcyclist blend, in this instance the dominant hand. Once partitioned off, the body part is free to participate in the creation of a new element. This development does not deactivate the motorcyclist blend, but it does have an impact. The |motorcyclist's| hands are no longer visible, but conceptually, they nevertheless continue to be understood to be on the |handles|. This is due to pattern completion, a blending operation that makes it possible to "fill in the blanks", as it were (Fauconnier and Turner 1998).

Pattern completion is available not only in such cases, but also in single real-space blends as well. When the signer is part of a blend, typically only the relevant portions of his body are projected into the blend. For example, even though the signer may actually be standing, the |motorcyclist| is not supposed to be conceptualized as standing as he moves uphill. Rather, the real-space legs are simply not part of the blend, and through pattern completion the |motorcyclist| is understood to be configured in the appropriate sitting position.

Here it is clear that a distinction can be made between two types of zones of the body

in terms of their potential roles in the creation of blend elements. As shown below, the manual articulators and the signer's face can both contribute to the creation of visible blend elements. Thus they have a special status as partitionable zones. Other parts of the body such as the signer's legs, while they can be part of real-space blends, are not conventionally partitioned off to create distinct visible elements. In the case of the motorcyclist blend, in which the signer's legs play no part, the legs are best understood as simply one portion of the signer's body that is not recruited from real space to be part of the blend. One observation regarding the existence of partitionable zones is that it is far from arbitrary that the body has the partitionable zones it has. This suggestion will be discussed in greater detail in section 5.

Returning to the manual articulators of the motorcyclist blend, the partitionable zones inherent in the signer's hands become available to produce a two-handed depicting verb that means 'vehicle moving forward on an unspecified surface.' This type of depicting verb has the dual task of signifying and depicting an action (Liddell 2003). In other words, these articulators, while producing a verb, also produce two distinct visible elements. The form of the handshapes can be seen in Figure 2 (in section 1). The palm of the Flat B handshape is facing away from the signer, and the ulnar side of the 3 handshape travels forward on the back of the B handshape. Schematically, this 3 handshape is understood to be a |vehicle|, and the B handshape is understood to be an |unspecified surface|. Within this conceptual integration network, these visible elements are also understood to be respectively the |motorcycle₂| and |part of the hill|.⁶

3.1 Scalar properties of blends

Generally, the scale of the real-space elements and their blend counterparts coincide.

For example, the height of the |motorcyclist| is assumed to be roughly equivalent to the real-space signer. When the signer is talking about a specific motorcyclist who happens to be much taller than the signer, this information would motivate an explicit adjustment (e.g., the |motorcyclist's| eye gaze would be cast lower when he looks at other |individuals| who are shorter. This adjustment would be necessary only if the "tallness" property of an element is important to the description. In this case, however, there is a disparity in the understood scale between the |motorcyclist| on one hand and the |motorcycle₂| and the |part of the hill| on the other.

The scale of the |motorcyclist| and the |motorcycle₂| in this example do not coincide. If they did, then one possible interpretation would be that the |motorcycle₂| is literally positioned inches away from the |motorcyclist's| chin. Certainly, this is not the intended interpretation. Furthermore, the introduction of the |motorcycle₂| makes a total of two grounded blend elements that have the narrative input space element *motorcycle* as their counterpart. Since it is not the intent of the signer to talk about two different motorcycles, how can we account for this?

A number of factors, including the existence of multiple real-space blends, ensure that these "incongruities" do not arise. One such factor is the contrast between *participant viewpoint* and *global viewpoint* associated with the two blends. The |motorcyclist| is the central participant of the motorcyclist blend, its viewpoint inherited from the signer's deictic center. Thus objects and events within this blend are described from the perspective of the |motorcyclist|. The scalar properties of such a blend, as Liddell (1995) shows, are understood to be life-sized elements, following the scale of similar objects in reality. This is a consequence of project-

ing the scalar properties of real space onto the blend.

The scalar properties in the second real-space blend contrast with those in the motorcyclist blend. Here the scalar properties are determined in part by certain properties of the 3 handshape. The length of the |vehicle| element of the depicting verb, for example, runs from the base of the hand to the fingertip of the middle finger. Thus compared to the life-sized |motorcyclist|, the specifications of this |vehicle| are on a much smaller scale. This scale is small enough to afford a more global viewpoint. For example, to describe the motorcyclist falling from the motorcycle, the signer can produce a verb meaning “fall from straddled position on bike”.⁷ This involves a V handshape understood to be a partially visible |rider|, which straddles the |vehicle| and subsequently falls from it. One reason such an interaction between these elements is possible has to do with the similarity of scale that they have as individual elements. The smaller scale of the global perspective depiction involving the |vehicle| is akin to a wide-angle shot in motion-picture production, while the real-space blend containing the participant |signer as actor| is akin to a close-up shot. It is not possible for the |signer as actor| and the |vehicle| to come into contact, and the difference in scale is one reason why.

When the |vehicle| becomes part of the conceptual integration network analyzed in this section, the |vehicle| is understood to be the |motorcycle₂|. As this |motorcycle₂| exists within its own mental space, it is distinct from the narrative input space *motorcycle* and the non-visible blended |motorcycle|. This in part explains how it is that the signer is only talking about a single motorcycle despite the existence of two blend elements that are understood to be motorcycles. As it is possible for additional |motorcycles| to exist within either blend (e.g., the narrative

may be about motorcycle racing involving several motorcycles), a discussion of connections between counterparts is necessary for a fuller explanation.

Before discussing the other partitionable zones of the body, I will make two further comments. In the blend discussed above, the use of partitioned manual articulators involved establishing the blend with participant viewpoint, followed by the blend with global viewpoint. However, signers have another conventional option available via the use of partitionable zones. Rather than following the establishment of the initial blend, partitionable zones can be projected into blends the moment the blends are created. It is possible, for instance, to simultaneously create two blends containing the |motorcyclist| and the |motorcycle₂|.

Second, body partitioning does not necessarily involve the production of multiple real-space blends. As is shown in the following, a partitioned manual articulator can also be used to create a second visible element of the *same* blend.

3.2 Partitionable zones in a single blend

The conceptual integration network that is produced here is made during a description of someone getting punched in the face. The narrative space input contains the two elements *victim* and *assailant* as well as a relation between the two, [PUNCH *assailant*, *victim*]. If the *assailant* is mapped onto the signer, this results in a visible element, |assailant|, and the punch would be thrown towards a non-visible |victim|. Another option is available to the signer via the partitionability of the manual articulator. The punch could be described from the victim’s perspective. In this case, *victim* would map onto the signer, creating a visible |victim|. The |assailant| is an entirely non-visible element until the punch materializes.



Figure 3. The *|victim|* and the *|assailant's forearm|*

To demonstrate the punch, the signer maps the *assailant's forearm* onto the partitionable manual articulator, which creates a visible *|assailant's forearm|*. The fist of this *|forearm|* moves to the *|victim's|* jaw, as shown in Figure 3. This interaction suggests that they are both elements of the same blend, in contrast with the *|motorcyclist|* and the *|motorcycle₂|* above, which cannot contact each other.⁸

4 NONMANUAL PARTITIONED ZONES

Nonmanual signals (NMSs) are a key component of signed languages, and they have multiple functions (Baker and Cokely 1980; Liddell 1980). Certain nonmanual signals function simply as phonological components of a sign. Some nonmanual signals are adverbial items, such as a particular lip configuration (glossed as “mm”) signifying that an action is being done in a regular or relaxed fashion. Varying clause types are marked by particular sets of nonmanual signals. In addition to these functions, nonmanual signals can contribute affective signals to discourse. Finally, as shown in this section, onomatopoeia-like items are produced non-manually as well.

There are at least two areas of the face that are partitionable zones. The oral articu-

lators can be partitioned to produce an onomatopoeic item, which contributes sensory detail to the blend. A second partitionable zone is the facial expression, in the sense that it can be used as a depiction of someone's facial expression from the perspective of a visible *|actor|* mapped onto the signer.

4.1 An onomatopoeic component

Like hearing people, deaf signers understand that certain motion events contain a sound emission component. That is, signers know that sound may be produced prior to, during, or at the endpoint of a motion event. Resources are available to signers via nonmanual signals that allow the simultaneous description of the motor event and the sound emission associated with it. This simultaneity is reflected lexically. Some verbs have a nonmanual component that is understood to be onomatopoeic, as the following example shows.

One verb that conventionally carries an onomatopoeic component is a depicting verb that means “liquid dropping from some container”, shown in Figure 4. The production of this verb begins with a closed handshape similar to the S handshape but with the fingernail of the index finger resting on the side of the thumb. The palm of this hand faces downward. Through the movement of the wrist, the hand descends as the index finger simultaneously opens.

The onomatopoeic item that is produced somewhat contiguously with this manual production is, similar to onomatopoeic forms in spoken languages, produced by the oral articulators; however, phonation is not a requisite feature here. The lips are pressed together during the initial segment of the sign. They open when the sign moves, and are pressed together again at the end of the sign production. This oral production resembles the phonation of “bip”. Thus

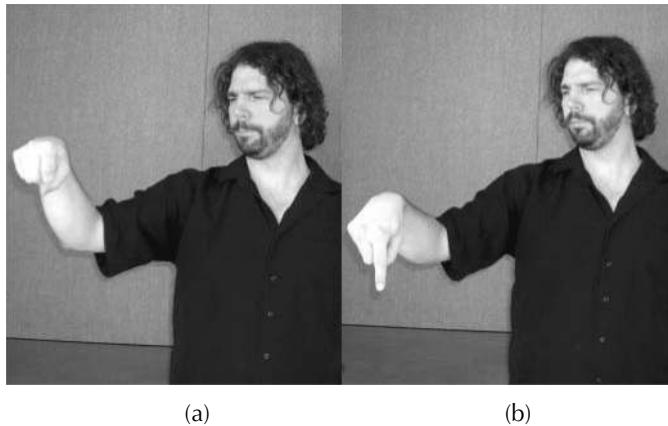


Figure 4. |Homeowner| (a) and |droplet of water| (b)

“bip” is a meaningful component of the verb. This affinity is reflected in the depicting verb—it is not conventional to produce the citation form of the verb without the onomatopoeic nonmanual component.

The manual component of this depicting verb corresponds to the existence of a drop of liquid and the movement of the articulator corresponds to the path the drop of liquid takes. To describe that someone, say a homeowner, saw a droplet of water fall from a faucet, the signer produces a real-space blend to which the verb contributes. The nongrounded input has the following elements that either have been previously introduced or are available through the frame of “leaking faucet”: *homeowner*, *faucet*, *sink*, *drop of water*. As in other real-space blends, the projection of input elements into the blend results in the existence of visible and non-visible elements. That is, *homeowner* is mapped onto the signer, producing a visible |homeowner|, *faucet* is mapped onto a portion of empty space producing a non-visible |faucet|, and so forth.

The |homeowner| is for the most part visible and is understood to be looking in the direction of the |sink|. The manual articulator is partitioned off to take part in mappings

that create the |path of falling water droplet|. This articulator is placed where the |faucet| is conceptualized to be. The oral articulators are partitioned off to add another sensory detail to the blend via the onomatopoeic component of the depicting verb. The onomatopoeic element in the blend is not construed as visible, despite its channel, but rather understood to be the auditory/vibratory result of the |drop of water| hitting the |sink|.

Whether the production of the depicting verb requires a separate blend appears to depend on where the |droplet of water| is conceptualized to be. If the location of the manual articulator corresponds to where the signer’s intended location of the |droplet of water| is, no separate blend is needed. The real-space blend in this case would be similar to the “someone receiving a punch” blend: instead of being in separate blends, distinct visible elements co-exist within a single blend. A second blend may be necessary in cases where the perceiver and the water droplet are some distance apart, rendering the former oblivious to both the water droplet and the sound made as it hits the sink. In this case, the |droplet of water| and the |“bip”| would co-exist in the separate

blend, resulting in a blend network similar to the “motorcycling uphill” blend network.

There appears to be a large class of onomatopoeic items in ASL, many of which are meaningful components of depicting verbs. These items, along with adverbials and other nonmanual signals, remain understudied. Future studies of nonmanual signals and their contribution to meaning construction would need to consider the status of oral articulators and, as shown below, facial expression as partitionable zones.

4.2 Partitioned facial expressions

The signer's facial expression, when partitioned off, can serve to depict the facial expression of an otherwise non-visible *|actor₂* from the perspective of the visible *|actor₁*. For example, consider a signer's description of receiving a glare from someone. Figure 5 illustrates the facial expression, body configuration, and a verb meaning “eye gaze being directed at a location”. The nongrounded input space contains the elements *self* and *other* as well as the relation [GLARE *other*, *self*]. The element *self* is mapped onto the signer, producing *|self*, and *other* is mapped onto a portion of empty physical space, producing a non-visible blend element *|other*.



Figure 5. The *|self*, the “eye gaze being directed” verb, and the glare

The signer produces the verb of perception with his right hand by positioning a V hand up and away from the deictic center, with the fingertips pointing back towards the signer. This verb is somewhat similar to the depicting verb in the “water droplet” blend in that it requires a component additional to the manual articulator to be produced in tandem with it. More specifically, as Liddell (2003: 131) notes, this verb of perception prompts a real-space blend containing a visible *|actor*. In the example described here, the *|self* has the role of “object of gaze”. In isolation, without contextual cues, the signer's facial expression could be understood to represent either that of the *|self* responding to the glare or that of the otherwise non-visible *|other* who is glaring at *|self*. If the signer intends the latter interpretation, this would involve the partitioning off of the facial expression. Conversely, had the *|self* been understood to inhabit the role of “gazer”, the glare would be associated with the *|self*, and thus no partitioning would occur.

Through prior discourse and contextual cues, the addressee knows that the facial expression is not made by the *|self*. Of course, partitioning off the glare does not result in the *|self* lacking a facial expression. Through pattern completion the *|self* is understood to have some facial expression, albeit a non-visible one. The intended facial expression of the self may be determined from discourse prior to partitioning or when a different facial expression replaces the partitioned glare.

5 PARTITIONABLE ZONES, THE NATURE OF SIGNED LANGUAGES, AND GESTURE

In the above discussion I have demonstrated the existence of four partitionable zones: both manual articulators, the oral articulators, and the facial expression. It appears reasonable to suggest that without these par-

titionable zones, certain properties of ASL and other signed languages might not exist. For instance, cases in which a visible |hand| is distinct from the visible |actor|, as in the punching example above, would not be possible. Without the ability to partition the manual articulator, the class of ASL verbs of handling would be constrained in their ability to be directed towards the visible |actor|, which would limit the choice of perspectives as well.

An inability to partition the manual articulators would also have a negative impact on the articulators taking part in mappings that create visible blend elements. Without partitioning, signers would not be able to produce depicting verbs when activating a real-space blend containing a visible |actor|. Moreover, certain types of depicting verbs, such as the “vehicle moving forward” verb, may not even be possible at all. One function these verbs have, as Liddell (2003) claims, lies in their ability to depict various aspects of their meaning. One such aspect involves the correspondence of the hand with an entity associated with the verb, such as |vehicle|. To be able to conceptualize the hand as a vehicle at all appears to involve the partitioning off of the hand from the real-space body. Without such partitionable zones, the inventory of these |hand as entity| elements in the ASL lexicon would be much smaller, and consequently, signed languages would be much different than the languages we know them to be.

Many factors appear to underlie the existence of the partitionable zones discussed in this article, but further discussion of these factors falls outside its scope. However, it is worth mentioning that these zones are not limited only to signers, but are available to nonsigners as well. This can readily be seen in the manual-gestural component that accompanies speech. Sometime during our development as human beings, through ex-

periences involving our hands and the hands of others that act on us, we must have become aware of the functional autonomy of the hand. For example, we learned that the hand can act on other parts of the body, including one’s own other hand. Such an ability is not possessed by, say, the shoulders. I would conjecture here that the role of the hand as an instrument of action appears to prime it for partitionability.

6 CONCLUSIONS

Real-space blends of the type described in this article are indispensable to ASL discourse in many ways. Their great utility comes from the rich amount of information available from such blends. As discussed, the number of distinct visible blended elements plays a large part in the amount of information available to addressees. Even though the signer’s body, as a single unit, may be projected into a blend to create visible |actors|, other visible elements are possible as well. This is due to the partitionable zones of the body, namely the hands and the face. These zones, when partitioned off from the signer’s body, create the additional visible elements that increase the richness of the conceptual integration network of which they become part. In other words, body partitioning plays a large role in providing the signer with a wider range of options in the creation of real-space blends than would otherwise be possible.

NOTES

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1. Following convention, words in vertical line brackets label grounded blend elements. Liddell (1995)

- calls such blends *surrogate blends* and elements within these blends *surrogates*.
2. See chapter 9 in Liddell (2003) for a discussion of depicting verbs.
 3. The Flat B handshape is a flat hand with the thumb unopposed. The citation form of the “vehicle moving on surface” has the ulnar side of the 3 handshape contacting the back of the flat B handshape.
 4. It should be kept in mind, however, that real-space blends are also found in other types of discourse as well.
 5. In this article, I will not describe the structure of generic spaces in detail, as it is pretty clear what the correspondences between input counterparts are.
 6. The subscript numeral in the label |motorcycle₂| serves to distinguish this element from its non-visible counterpart |motorcycle| in the motorcyclist blend.
 7. Use of this verb appears to require that the |vehicle| be understood to be either a bike or a motorcycle. A different verb that lacks the depiction of straddling would be used to describe falling from other types of vehicles.
 8. See Janzen, O’Dea, and Shaffer (2001) for examples of body partitioning in their investigation of passive constructions in ASL.

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Syntax: The Analysis of Sentence Structure

WILLIAM O'GRADY

. . . the game is to say something new with old words.

—Ralph Waldo Emerson, *Journals*, 1849

OBJECTIVES

In this chapter, you will learn:

- how we categorize words
- how words can be combined into phrases and sentences according to a systematic schema
- that words “choose” what they can combine with in the same phrase
- how questions are derived from statements
- how to diagram the structure of sentences
- how all languages are alike in the way sentences are constructed
- how languages can differ systematically in the way sentences are constructed

Not much can be said with a single word. If language is to express complex thoughts and ideas, it has to have a way to combine words into sentences. In this chapter, we will consider how this is done, focusing on the component of the grammar that linguists call **syntax**.

As noted in Chapter 1, speakers of a language are able to combine words in novel ways, forming sentences that they have neither heard nor seen before. However, not just any combination of words will produce a well-formed sentence. English speakers

recognize that the pattern in 1 is not permissible even though the same words can be combined in a different way to form the acceptable sentence in 2.

- 1) *House painted student a the.
- 2) A student painted the house.

We say that an utterance is **grammatical** if native speakers judge it to be a possible sentence of their language.

The study of syntax lies very close to the heart of contemporary linguistic analysis, and work in this area is notorious both for its diversity and for its complexity. New ideas are constantly being put forward, and there is considerable controversy over how the properties of sentence structure should be described and explained.

This chapter will introduce a simple version of **transformational** (or **generative**) **grammar**. Although many linguists disagree with various features of this approach, it is very widely used in linguistics and other disciplines concerned with language (especially cognitive science). For this reason, it is the usual point of departure for introductions to the study of sentence structure.

An intriguing aspect of work within transformational syntax is the emphasis on **Universal Grammar (UG)**, the system of categories, operations, and principles that are shared by all languages. The key idea is that despite the many superficial differences

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among languages, there are certain commonalities with respect to the manner in which sentences are formed. As things now stand, it is widely believed that the syntactic component of any grammar must include at least two subcomponents. The first of these is a **lexicon**, or mental dictionary, that provides a list of the language's words along with information about their pronunciation, their form, and their meaning.

The second subcomponent consists of what can be called a **computational system**, by which we simply mean operations that combine and arrange words in particular ways. As we will see a little later in this chapter, the two principal structure-building operations made available by Universal Grammar are **Merge** (which combines elements to create phrases and sentences) and **Move** (which transports an element to a new position within a particular sentence).

We will begin our discussion of these matters in Section 1 by introducing some of the most common categories of words found in language and by investigating how they can be combined into larger structural units.

1 CATEGORIES AND STRUCTURE

A fundamental fact about words in all human languages is that they can be grouped together into a relatively small number of classes called **syntactic categories**. This classification reflects a variety of factors, including the type of meaning that words express, the type of affixes that they take, and the type of structures in which they can occur.

1.1 Categories of Words

Table 5.1 provides examples of the word-level categories that are most central to the study of syntax. The four most studied syntactic categories are **noun (N)**, **verb (V)**, **adjective (A)**, and **preposition (P)**. These elements, which are often called **lexical categories**, play a very important role in sentence formation, as we will soon see. A fifth and less studied lexical category consists of **adverbs (Adv)**, most of which are derived from adjectives.

Languages may also contain **nonlexical** or **functional categories**, including **determiner (Det)**, **auxiliary verb (Aux)**, **conjunction (Con)**, and **degree word (Deg)**.

Table 5.1 Syntactic Categories

| Lexical Categories | Examples |
|-----------------------|---|
| Noun (N) | Harry, boy, wheat, policy, moisture, bravery |
| Verb (V) | arrive, discuss, melt, hear, remain, dislike |
| Adjective (A) | good, tall, old, intelligent, beautiful, fond |
| Preposition (P) | to, in, on, near, at, by |
| Adverb (Adv) | slowly, quietly, now, always, perhaps |
| Nonlexical Categories | Examples |
| Determiner (Det) | the, a, this, these, no (as in no books) |
| Auxiliary verb (Aux) | |
| Modal | will, can, may, must, should, could |
| Nonmodal | be, have |
| Conjunction (Con) | and, or, but |
| Degree word (Deg) | too, so, very, more, quite |

Such elements generally have meanings that are harder to define and paraphrase than those of lexical categories. For example, the meaning of a determiner such as *the* or an auxiliary such as *would* is more difficult to describe than the meaning of a noun such as *hill* or *vehicle*.

A potential source of confusion in the area of word classification stems from the fact that some items can belong to more than one category.

3) *comb* used as a noun:

The woman found a comb.

comb used as a verb:

The boy should comb his hair.

4) *near* used as a preposition:

The child stood near the fence.

near used as a verb:

The runners neared the finish line.

near used as an adjective:

The end is nearer than you might think.

How then can we determine a word's category?

Meaning. One criterion involves meaning. For instance, nouns typically name entities, including individuals (*Harry, Sue*) and objects (*book, desk*). Verbs, on the other hand, characteristically designate actions (*run, jump*), sensations (*feel, hurt*), and states (*be, remain*). Consistent with these tendencies, *comb* in 3 refers to an object when used as a noun but to an action when used as a verb.

The typical function of an adjective is to designate a property or attribute of the entities denoted by nouns. Thus, when we say *that tall building*, we are attributing the property 'tall' to the building designated by the noun.

In a parallel way, adverbs typically denote properties and attributes of the actions, sensations, and states designated by verbs. In

the following sentences, for example, the adverb *quickly* indicates the manner of Janet's leaving and the adverb *early* specifies its time.

5) Janet left quickly.

Janet left early.

A word's category membership does not always bear such a straightforward relationship to its meaning, however. For example, there are nouns such as *difficulty, truth, and likelihood* that do not name entities in the strict sense. Moreover, even though words that name actions tend to be verbs, nouns may also denote actions (*push* is a noun in *give someone a push*).

Matters are further complicated by the fact that in some cases, words with very similar meanings belong to different categories. For instance, the words *like* and *fond* are very similar in meaning (as in *Mice like/are fond of cheese*), yet *like* is a verb and *fond* is an adjective.

Inflection. Most linguists believe that meaning is only one of several criteria that enter into determining a word's category. As shown in Table 5.2, inflection can also be very useful for distinguishing among different categories of words. (For a discussion of inflection, see Chapter 4, Section 4.) However, even inflection does not always provide the information needed to determine a word's category. In English, for example, not all adjectives can take the comparative and superlative affixes (**intelligenter, beautifulest*), and some nouns cannot be pluralized (*moisture, bravery, knowledge*).

Distribution. A third and often more reliable criterion for determining a word's category involves the type of elements (especially functional categories) with which it can co-occur (its distribution). For example, nouns can typically appear with a determiner, verbs

Table 5.2 Lexical Categories and Their Inflectional Affixes

| Category | Inflectional Affix | Examples |
|---------------|---------------------------------|----------------------------|
| N (Noun) | plural <i>-s</i> | books, chairs, doctors |
| | possessive <i>'s</i> | John's, (the) man's |
| V (Verb) | past tense <i>-ed</i> | arrived, melted, hopped |
| | progressive <i>-ing</i> | arriving, melting, hopping |
| | third person singular <i>-s</i> | arrives, melts, hops |
| A (Adjective) | comparative <i>-er</i> | taller, faster, smarter |
| | superlative <i>-est</i> | tallest, fastest, smartest |

Table 5.3 Distributional Properties of Nouns, Verbs, and Adjectives

| Category | Distributional Property | Examples |
|---------------|-------------------------------|---------------------|
| Noun (N) | occurrence with a determiner | a car, the wheat |
| Verb (V) | occurrence with an auxiliary | has gone, will stay |
| Adjective (A) | occurrence with a degree word | very rich, too big |

with an auxiliary, and adjectives with a degree word in the sort of patterns illustrated in Table 5.3.

Of course, a verb cannot occur with a determiner or degree word in these sorts of patterns, and a noun cannot occur with an auxiliary.

6) a verb with a determiner:

*the destroy

a verb with a degree word:

*very arrive

a noun with an auxiliary:

*will destruction

Distributional tests for category membership are simple and highly reliable. They can be used with confidence when it is necessary to categorize words you are unsure of.

1.2 Phrase Structure

Sentences are not formed by simply stringing words together like beads on a necklace. Rather, sentences have a hierarchical design in which words are grouped together into

successively larger structural units. This section will focus on the structure of **phrases**, which are the units that stand between words and sentences in syntactic structure.

The Blueprint. As a first approximation, it is often suggested that a typical phrase can be broken down into three parts—a **head**, a **specifier**, and a **complement**—arranged as specified in the blueprint or X' schema shown in Figure 5.1. (X' is pronounced “X bar”.) X stands for any category (e.g., N, V, A, P), so XP stands for a phrase such as NP, VP, AP, or PP.

Such structures, which are often called (inverted) trees, capture the hierarchical organization of phrases and sentences. In

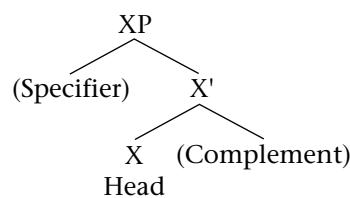


Figure 5.1. The X' schema.

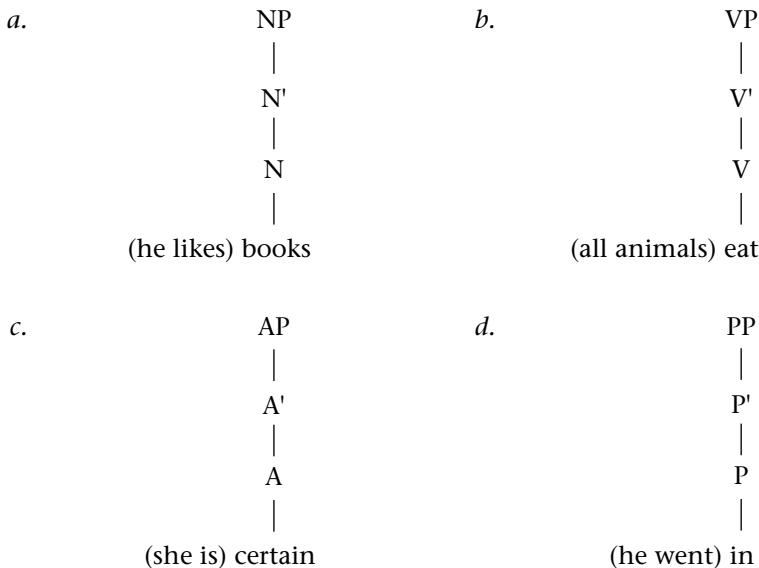


Figure 5.2. Phrases consisting of only a head.

particular, the schema captures four generalizations:

1. All phrases have a three-level structure (X, X', and XP).
2. All phrases contain a head, X.
3. If there is a complement, it is attached at the intermediate X' level, as a “sister” of the head.
4. If there is a specifier, it is attached at the XP level.

Let us consider each part of a phrase's architecture in turn.

Heads. The head is the obligatory nucleus around which a phrase is built. For now, we will focus on four categories that can function

as the head of a phrase — nouns, verbs, adjectives, and prepositions. Thus, to start out, the X in the X' schema can be N, V, A, or P.

Although phrases usually consist of two or more words, a head may form a phrase all by itself, as shown in the examples in Figure 5.2. When this happens, the resulting structure has a single straight branch from which only the head hangs.

Specifiers. The type of specifier that appears in a particular phrase depends on the category of the head. Determiners serve as the specifiers of Ns, while preverbal adverbs typically function as the specifiers of Vs and degree words as the specifiers of As and (some) Ps (see Table 5.4).

Table 5.4 Some Specifiers

| Category | Typical Function | Examples |
|-------------------|---------------------|-------------------------------|
| Determiner (Det) | specifier of N | the, a, this, those, no |
| Adverb (Adv) | specifier of V | never, perhaps, often, always |
| Degree word (Deg) | specifier of A or P | very, quite, more, almost |

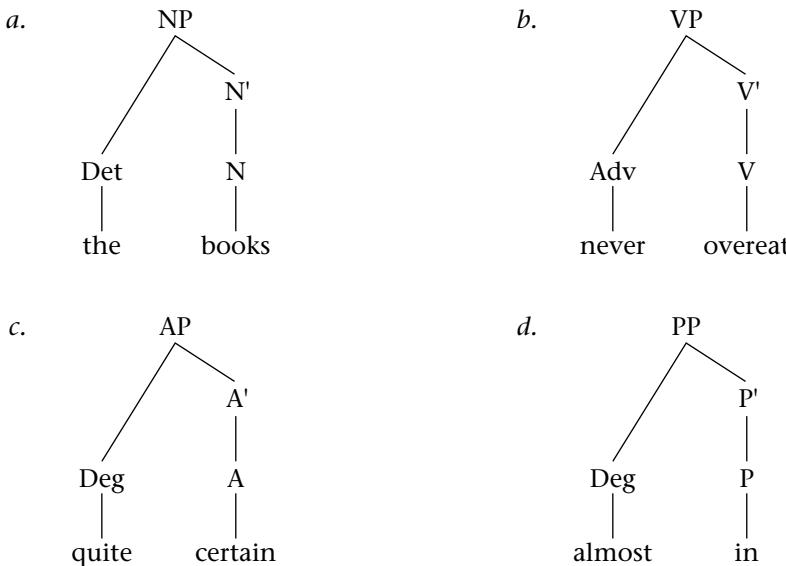


Figure 5.3. Some phrases consisting of a specifier and a head.

When a specifier is present, it attaches to XP in accordance with the X' schema. This gives structures such as the ones shown in Figure 5.3.

Syntactically, specifiers typically mark a phrase boundary. In English, specifiers occur at the beginning of their respective phrases, as illustrated in the examples below [Figure 5.3].

Semantically, specifiers help to make the meaning of the head more precise. Hence, the determiner (Det) *the* in *a* indicates that the speaker has in mind specific books, the adverb *never* in *b* indicates nonoccurrence of the event, and the degree words (Deg) *quite* and *almost* in *c* and *d* indicate the extent to which a particular property or relation is manifested.

Complements. Consider now some examples of slightly more complex phrases. The head is underlined in each phrase.

- 7) a. [I_{NP} the books about the war]
 b. [I_{VP} never eat a hamburger]
 c. [I_{AP} quite certain about Mary]
 d. [I_{PP} almost in the house]

In addition to a specifier and the underlined head, the phrases in 7 also contain a complement. These elements, which are themselves phrases, provide information about entities and locations whose existence is implied by the meaning of the head. For example, the meaning of *eat* implies an object that is eaten, the meaning of *in* implies a location, and so on.

- 8) A vegetarian would never eat [a hamburger].

↑ ↑

head *complement naming the thing eaten*

- 9) in [the house]

↑ ↑

head *complement naming a location*

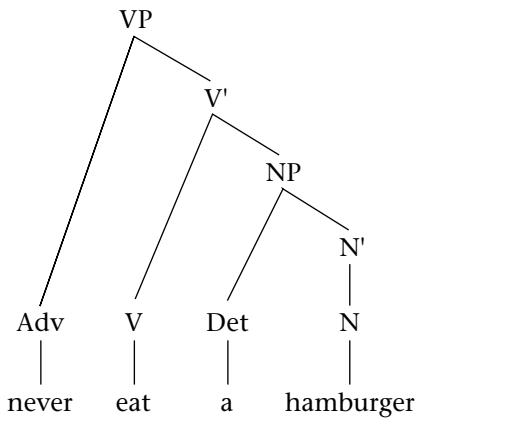


Figure 5.4. A VP consisting of a specifier, a head, and a complement.

Figure 5.4 illustrates the structure of a phrase consisting of a specifier, a head, and a complement. (The NP serving as complement of a V is often called a **direct object**.)

ject; a verb taking a direct object is called **transitive**.) As noted above, complements are themselves phrases. Thus, the complement of the *V eat* is an NP that itself consists of a determiner (*a*) and a head (*hamburger*).

NPs, APs, and PPs have a parallel internal structure, as the examples in Figure 5.5 illustrate. (In order to save space, we do not depict the internal structure of the complement phrases in these examples. For the full structure of any tree abbreviated in this way go to bedfordstmartins.com/linguistics/syntax and click on **trees**.)

Of course, it is also possible to have phrases that consist of just a head and a complement, with no specifier. This results in the type of bottom-heavy structures depicted in Figure 5.6.

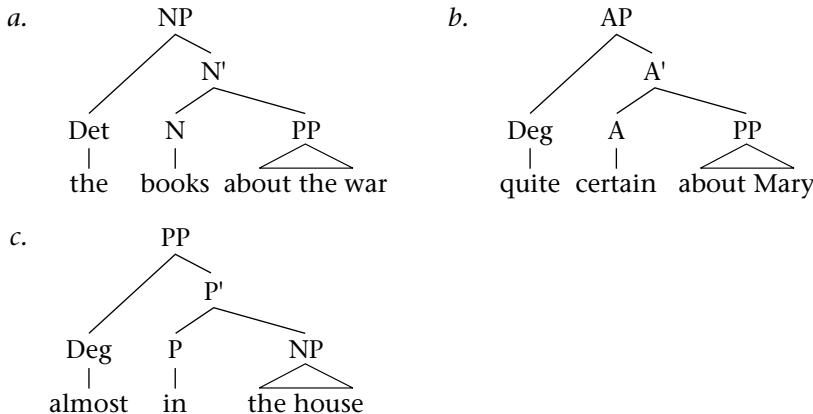


Figure 5.5. Other phrases consisting of a specifier, a head, and a complement.

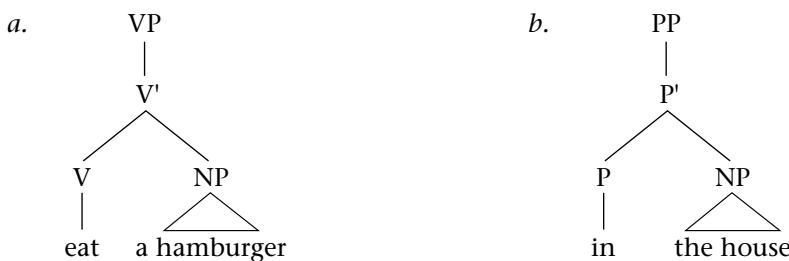


Figure 5.6. Phrases consisting of a head and a complement.

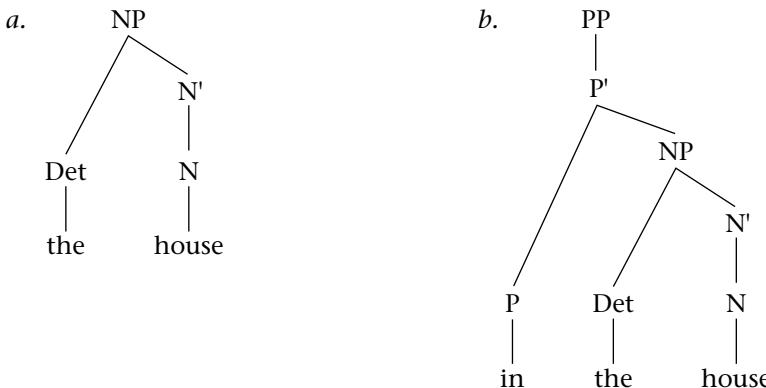


Figure 5.7. The Merge operation in action.

The Merge Operation. We can now formulate the following operation for sentence building.

10) Merge

Combine words in a manner compatible with the X' schema.

The Merge operation is able to take a determiner such as *the* and combine it with an N' consisting of the N *house* to form the NP *the house*. It is then able to take a head such as the preposition *in* and combine it with the NP *the house* to form the P' and PP *in the house* (see Figure 5.7). Continued application of the Merge operation to additional words can lead to the formation of

phrases and sentences of unlimited complexity.

1.3 Sentences

The largest unit of syntactic analysis is the sentence. Sentences have as their head an abstract category dubbed I (or Infl for ‘inflection’) that indicates the sentence’s tense. The I category takes a VP as its complement and the sentence’s subject as its specifier. This results in the structure depicted in Figure 5.8 (Pst = Past). The tense feature in I must be compatible with the form of the verb. So a sentence like the one [in Figure 5.8] whose head contains the feature +Pst

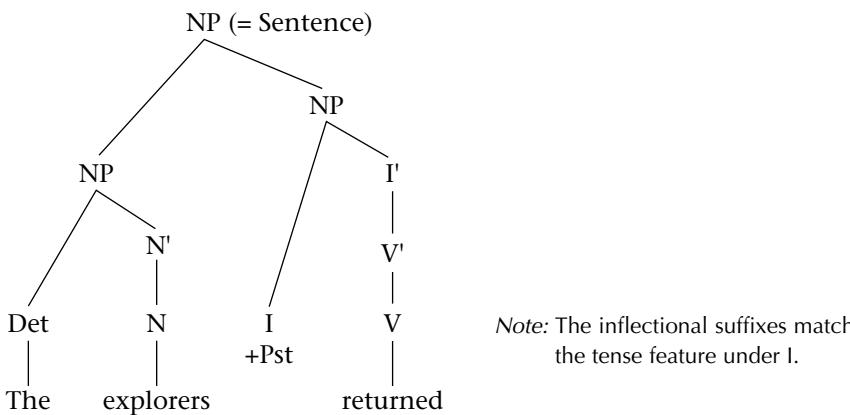


Figure 5.8. The structure of a sentence.

must contain a verb marked for the past tense.

Although somewhat abstract, this analysis has the advantage of giving sentences the same internal structure as other phrases (with a specifier, a head, and a complement), making them consistent with the X' schema. Moreover, because I, like all heads, is obligatory, we also account for the fact that all sentences have tense (e.g., in English they are all past or nonpast).

The structure in Figure 5.8 also provides us with a natural place to locate modal auxiliaries such as *can*, *will*, and *must*, most of which are inherently nonpast, as shown by the unacceptability of **He can/will/must work yesterday*. (The auxiliaries *could* and *would* can be either past or nonpast—e.g., *He could swim tomorrow/He could swim when he was three*.) Although traditionally analyzed as auxiliary verbs, these words are treated as instances of the I category in contemporary linguistic analysis, as depicted in Figure 5.9. (We will discuss the status of nonmodal auxiliaries such as *have* and *be* in Section 4.1.) This neatly accounts not only for the fact that modals have an inherent tense but also for their occurrence between the subject (the specifier) and the VP (the

complement)—in the position reserved for the head of the sentence. (It must be admitted, however, that the use of the term inflection by syntacticians to include free morphemes is unfortunate.)

1.4 Tests for Phrase Structure

How can linguists be sure that they have grouped words together into phrases in the right way? The existence of the syntactic units, or **constituents**, found in tree structures can be independently verified with the help of special tests. We will briefly consider three such tests here as they apply to XP-level constituents. (Not every test works for every constituent, though.)

The Substitution Test. Evidence that phrases are syntactic units comes from the fact that they can often be replaced by an element such as *they*, *it*, or *do so*. This is illustrated in 11, where *they* replaces the NP *the children* and *do so* replaces the VP *stop at the corner*. (This is called a substitution test.)

- 11) [_{NP} The children] will [_{VP} stop at the corner] if
they see us do so.

(*they* = the children; *do so* = stop at the corner)

The substitution test also confirms that a PP such as *at the corner* is a unit since it can be replaced by a single word in a sentence such as 12.

- 12) The children stopped [_{PP} at the corner], and we
stopped *there* too.
(*there* = at the corner)

Elements that do not form a constituent cannot be replaced in this way. Thus, there is no word in English that we can use to replace *children stopped*, for example, or *at the*.

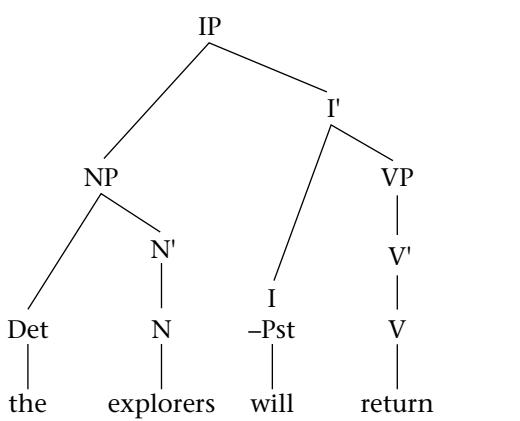


Figure 5.9. An IP with an auxiliary in the I position.

The Movement Test. A second indication that *at the corner* forms a constituent is that it can be moved as a single unit to a different position within the sentence. (This is called

a **movement test**.) In 13, for instance, *at the corner* can be moved from a position after the verb to the beginning of the sentence.

- 13) They stopped [_{pp} at the corner]. → [_{pp} At the corner], they stopped.

Of course, *at the*, which is not a syntactic unit, cannot be fronted in this manner (**At the, they stopped corner*).

The Coordination Test. Finally, we can conclude that a group of words forms a constituent if it can be joined to another group of words by a conjunction such as *and*, *or*, or *but*. (This is known as the **coordination test** since patterns built around a conjunction are called **coordinate structures**.) The sentence in 14 illustrates how coordination can be used to help establish that *stopped at the corner* is a constituent.

- 14) The children [_{vp} stopped at the corner] and [_{vp} looked both ways].

2 COMPLEMENT OPTIONS

How can we be sure that individual words will occur with a complement of the right type in the syntactic structures that we have been building? Information about the complements permitted by a particular head is included in its entry in a speaker's lexicon. For instance, the lexicon for English in-

cludes an entry for *devour* that indicates its syntactic category (V), its phonological representation, its meaning, and the fact that it takes an NP complement.

- 15) *devour*: category: V
phonological representation:
/dəvəwər/
meaning: 'eat hungrily'
complement: NP

The term **subcategorization** is used to refer to information about a word's complement options.

Subcategorization information helps ensure that lexical items appear in the appropriate types of tree structures. For example, by saying that *devour* belongs to the subcategory of verbs that require an NP complement, we are permitting it to occur in patterns such as 16a but not 16b.

- 16) a. *devour* with an NP complement:
The child devoured [_{np} the sandwich].
b. *devour* without an NP complement:
*The child devoured.

2.1 Complement Options for Verbs

Table 5.5 illustrates some of the more common complement options for verbs in English. The subscripted prepositions indicate subtypes of PP complements where this is relevant. *Loc* stands for any preposition

Table 5.5 Some Examples of Verb Complements

| Complement Option | Sample Heads | Example |
|---|---------------------|--|
| Ø | vanish, arrive, die | The rabbit vanished ____. |
| NP | devour, cut, prove | The professor proved [_{np} the theorem]. |
| AP | be, become | The man became [_{ap} very angry]. |
| PP _{to} | dash, talk, refer | The dog dashed [_{pp} to the door]. |
| NP NP | spare, hand, give | We handed [_{np} the man] [_{np} a map]. |
| NP PP _{to} | hand, give, send | She gave [_{np} a diploma] [_{pp} to the student]. |
| NP PP _{for} | buy, cook, reserve | We bought [_{np} a hat] [_{pp} for Andy]. |
| NP PP _{loc} | put, place, stand | She put [_{np} the muffler] [_{pp} on the car]. |
| PP _{to} PP _{about} | talk, speak | I talked [_{pp} to a doctor] [_{pp} about Sue]. |
| NP PP _{for} PP _{with} | open, fix | We opened [_{np} the door] [_{pp} for John] [_{pp} with a crowbar]. |

expressing a location (such as *near*, *on*, *under*). The verbs in the first line of Table 5.5 (*vanish*, *arrive*, and *die*) occur without any complement, those in the second line occur with an NP complement, and so on.

A word can belong to more than one subcategory. The verb *eat*, for example, can occur either with or without an NP complement and therefore belongs to both of the first two subcategories in our table.

- 17) After getting home, they ate (the sandwiches).

Of course, not all verbs exhibit this flexibility. As we have already seen, *devour*—although similar in meaning to *eat*—requires an NP complement and therefore belongs only to the second subcategory in our table.

As the examples in Table 5.5 also show, some heads can take more than one complement. The verb *put* is a case in point, since it requires both an NP complement and a PP complement.

- 18) *put* with an NP complement and a PP complement:

The librarian put [_{NP} the book] [_{PP} on the shelf].

Table 5.6 Some Examples of Noun Complements

| Complement Option | Sample Heads | Example |
|--|---------------------------------------|--|
| Ø | car, boy, electricity | the car __ |
| PP _{of} | memory, failure, death | the memory [_{PP} of a friend] |
| PP _{of} PP _{to} | presentation, gift, donation | the presentation [_{PP} of a medal] [_{PP} to the winner] |
| PP _{with} PP _{about} | argument, discussion, conversation | an argument [_{PP} with Stella] [_{PP} about politics] |

Table 5.7 Some Examples of Adjective Complements

| Complement Option | Sample Heads | Example |
|---------------------|----------------------|---|
| Ø | tall, green, smart | very tall |
| PP _{about} | curious, glad, angry | curious [_{PP} about China] |
| PP _{to} | apparent, obvious | obvious [_{PP} to the student] |
| PP _{of} | fond, full, tired | fond [_{PP} of chocolate] |

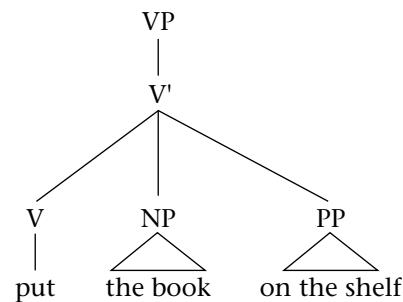


Figure 5.10. A verb with two complements.

- 19) *put* without an NP complement:
*The librarian put [_{PP} on the shelf].

- 20) *put* without a PP complement:
*The librarian put [_{NP} the book].

The VP *put the book on the shelf* has the structure in Figure 5.10, in which the V consists of the head *put* and its two complements—the NP *the book* and the PP *on the shelf*.

2.2 Complement Options for Other Categories

Various complement options are also available for Ns, As, and Ps. Tables 5.6, 5.7, and

Table 5.8 Some Examples of Preposition Complements

| Complement Option | Sample heads | Example |
|-------------------|------------------|-----------------------------------|
| \emptyset | near, away, down | (he got) down __ |
| NP | in, on, by, near | in [NP <i>the house</i>] |
| PP | down, up, out | down [PP <i>into the cellar</i>] |

5.8 provide examples of just some of the possibilities.

Here again subcategorization ensures that particular heads can appear in tree structures only if there is an appropriate type of complement. Thus, the adjective *tired* takes an *of-PP* as its complement, while the adjective *fed up* takes a *with-PP*.

- 21) a. tired [PP of cafeteria food] (compare: *tired with cafeteria food)
 b. fed up [PP with cafeteria food] (compare: *fed up of cafeteria food)

A good deal of what we know about our language consists of information about words and the type of complements with which they can appear. Much of this information must be stored in the lexicon, since it cannot be predicted from a word's meaning.

2.3 Complement Clauses

All human languages allow sentence-like constructions to function as complements. A simple example of this from English is given in 22.

The smaller bracketed phrase in 22 is called a **complement clause**; the larger phrase in which it occurs is called the **matrix clause**.

Words such as *that*, *whether*, and *if* are known as **complementizers** (C). They take

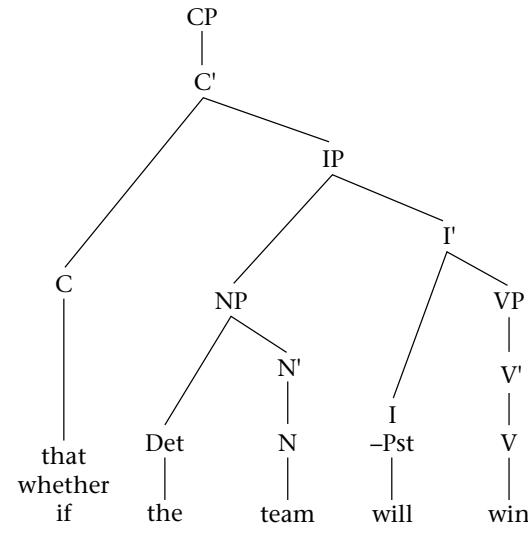


Figure 5.11. The structure of a CP.

an IP complement, forming the CP (complementizer phrase) depicted in Figure 5.11. Given our X' schema, we must also ask about a possible specifier position for CP. As we will see in Section 3.4, there is even a type of element that can occur in the specifier position under CP.

When a CP occurs in a sentence such as 22, in which it serves as complement of the verb *know*, the entire sentence has the structure shown in Figure 5.12. Table 5.9 provides examples of some of the verbs that are commonly found with this type of complement.

- 22) [The coach knows [that/whether/if the team will win]].
- complement clause
- matrix clause

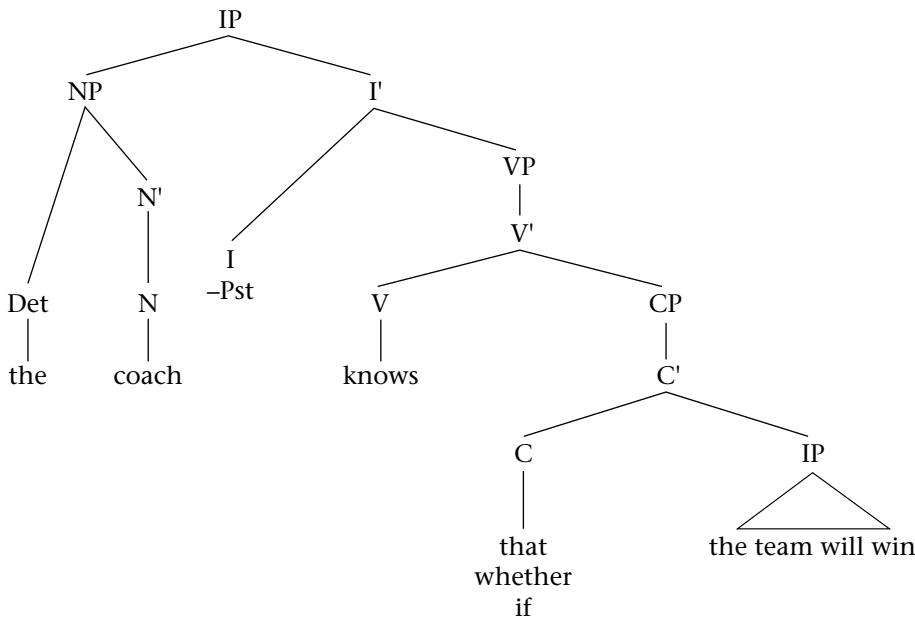


Figure 5.12. The structure of a sentence with an embedded CP.

Table 5.9 Some Verbs Permitting CP Complements

| Complement Option | Sample Heads | Example |
|-------------------|-----------------------------------|---|
| CP | believe, know, think, remember | They believe [_{CP} <i>that Mary left</i>]. |
| NP CP | persuade, tell, convince, promise | They told [_{NP} <i>Eric</i>] [_{CP} <i>that Mary had left</i>]. |
| CP | concede, admit | They admitted [_{PP} <i>to Eric</i>] [_{CP} <i>that Mary had left</i>]. |

There is no limit on the number of embedded clauses that can occur in a sentence, as 23 helps show.

- 23) A man thought [_{CP} *that a woman said* [_{CP} *that Sue reported* [_{CP} *that . . .*]]]

This structure is made possible by the fact that any CP can contain a verb that itself takes a complement CP. The first clause in our example contains the verb *think*, whose complement clause contains the verb *say*, whose complement clause contains *report*, and so on.

3 MOVE

As we have seen, it is possible to build a very large number of different sentences by allowing the Merge operation to combine words and phrases in accordance with the X' schema and the subcategorization properties of individual words. Nonetheless, there are still many sentences that we cannot build. This section considers two such patterns and discusses the sentence-building operation needed to accommodate them.

3.1 Yes-No Questions

To begin, let us consider the question sentences exemplified in 24. (Such structures are called **yes-no questions** because the expected response is usually “yes” or “no.”)

- 24) a. *Should that guy go?*
 b. *Can the cat climb this tree?*

A curious feature of these sentences is that the auxiliary verb occurs at the beginning of the sentence rather than in its more usual position to the right of the subject, as illustrated in 25.

- 25) a. *That guy should go.*
 b. *The cat can climb this tree.*

Given that auxiliary verbs such as *should* and *can* are instances of the I category, the X' schema dictates that they should occur in the position depicted in Figure 5.13. How, then, does the word order in 24 come about?

The formation of question structures requires the use of a structure-building operation that we can call Move. Traditionally known as a **transformation** because it transforms an existing structure, Move applies to

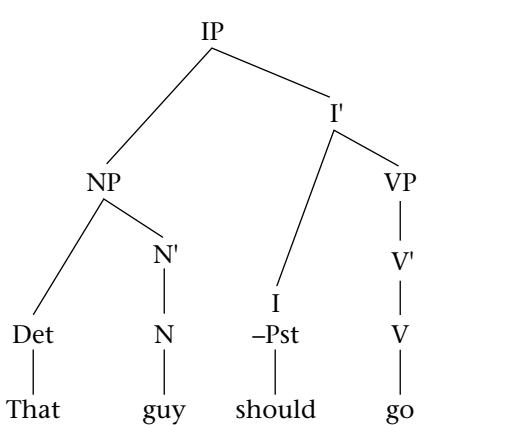


Figure 5.13. *Should* occurring in the head position between the subject (its specifier) and the VP (its complement).

structures such as the one in Figure 5.13 and moves the auxiliary verb in the I position to a new position in front of the subject.

- 26) Should that guy go?



The transformational analysis has at least two advantages. First, it allows us to avoid the conclusion that there are two types of auxiliary verbs in English: one that occurs between the subject and the VP and one that occurs in front of the subject. Under the transformational analysis, all auxiliaries originate inside the sentence. Auxiliaries that occur in front of the subject simply undergo an extra process — the Move operation that transports the I category in front of the subject in order to signal a question.

Second, the transformational analysis automatically captures the fact that the sentence *Should that guy go?* is the question structure corresponding to *That guy should go*. According to the analysis presented here, both sentences initially have the same basic structure. They differ only in that the Move operation has applied to the I category in the question structure.

A Landing Site for I. In what position does the auxiliary verb land when it is moved in front of the subject? This question can be answered if we assume that IPs occur within larger CPs, as depicted in Figure 5.14. By adopting this structure, we take the position that all IPs occur within a CP, whether they are embedded or not. It may help to think of the CP category as a shell that forms an outer layer of structure around an IP. When embedded within a larger sentence, the CP can contain an overt complementizer such as *that* or *whether*. Elsewhere, the C position simply contains information about whether the sentence is a statement or a question. For

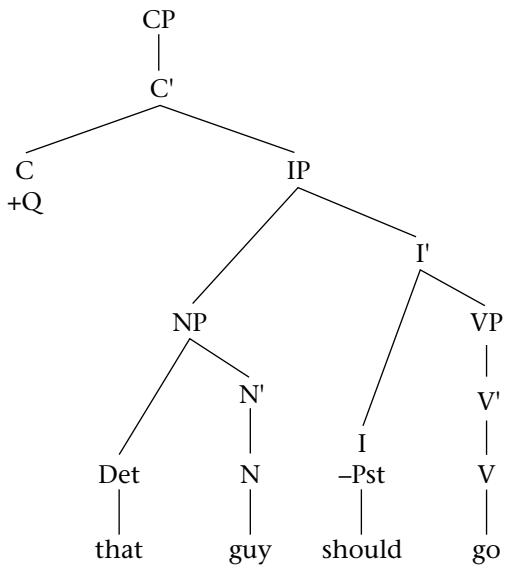


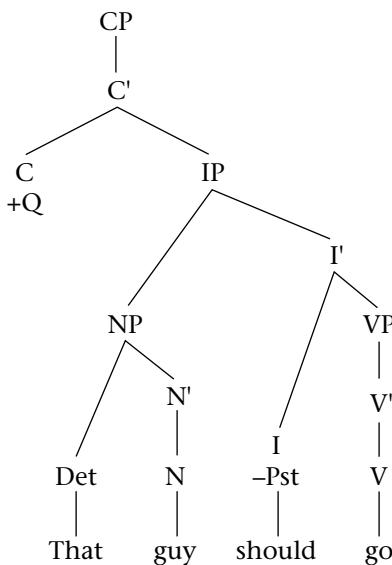
Figure 5.14. An IP inside a CP shell.

the sake of illustration, we use the symbol $+Q$ to indicate a question; sentences with no such symbol in their C position will be interpreted as statements.

In some languages, the **Q feature** is spelled out as a separate morpheme (for further discussion of this, go to bedfordstmartins.com/linguistics/syntax and click on variation). In languages like English, where there is no such morpheme, the feature must attract another element to its position. The auxiliary verb in the I position is that element. This is illustrated in Figure 5.15, where the Q feature in the C position attracts the auxiliary verb in the I position, causing it to move to the beginning of the sentence.

A transformation (i.e., a Move operation) can do no more than change an element's position. It does not change the categories of any words and it cannot eliminate any part of the structure created by the Merge operation. Thus, *should* retains its I label even though it is moved into the C position, and the position that it formerly occupied remains in the tree structure. Called a **trace** and marked by the symbol *t*, it records the fact that the moved

a. Structure formed by Merge



b. After Move

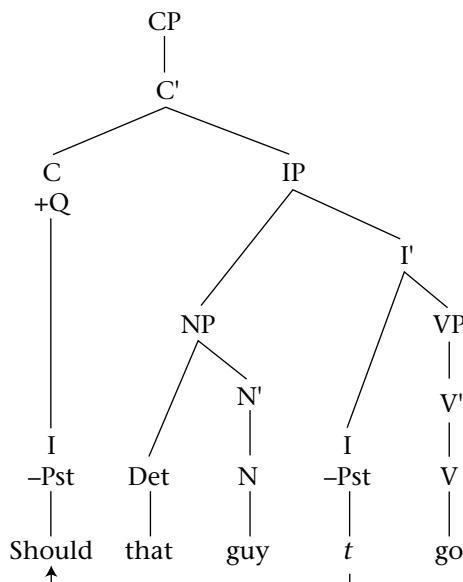


Figure 5.15. Movement of an auxiliary from the I position to the C position.

element comes from the head position within IP.

The Move operation used for yes-no questions is often informally called **Inversion** and is formulated as follows.

27) Inversion:

Move I to C.

Is there any way to be sure that this idea is on the right track and that the auxiliary verb in the I position really does move to the C position? Some interesting evidence comes from the analysis of the embedded CPs in sentences such as the following.

28) He asked [_{CP} whether we would return].

Notice that the C position in the embedded clause is occupied by the complementizer *whether*. Assuming that no more than one word can occur in a particular position, we predict that Inversion should not be able to apply in the embedded clause since there is nowhere for the moved auxiliary verb to land. The ungrammaticality of 29 shows that this is correct.

29) Inversion in an embedded CP that includes a complementizer:

*He asked [_{CP} whether would we *t* return].



Interestingly, the acceptability of Inversion improves quite dramatically when there is no complementizer and the C position is therefore open to receive the moved auxiliary. (This sort of sentence sounds most natural when the embedded clause is interpreted as a sort of quotation.)

30) Inversion in an embedded CP that does not have a complementizer:

He asked [_{CP} would we *t* return].



Although some speakers prefer not to apply Inversion in embedded clauses at all (especially in formal speech), most speakers of English find 30 to be much more natural

than 29. This is just what we would expect if Inversion moves the auxiliary to an empty C position, as required by our analysis.

To summarize before continuing, we have introduced two changes into the system of syntactic analysis used until now. First, we assume that all IPs occur inside CPs. Second, we assume that the Inversion transformation moves the auxiliary from the I position to an empty C position in front of the subject NP. This not only gives the correct word order for question structures, but also helps explain why inversion sounds so unnatural when the C position is already filled by another element, as in 29.

3.2 Deep Structure and Surface Structure

The preceding examples show that at least some sentences must be analyzed with the help of two distinct types of mechanisms. The first of these is the Merge operation, which creates tree structures by combining categories in a manner consistent with their subcategorization properties and the X' schema. The second is the Move operation, which can modify these tree structures by moving an element from one position to another. The process whereby a syntactic structure is formed by these operations is called a **derivation**.

In traditional work in transformational syntax, all instances of the Merge operation take place before any instances of the Move operation. As a result, the derivation for a sentence typically yields two distinct levels of syntactic structure, as shown in Figure 5.16. The first, called **deep structure** (or **D-structure**), is formed by the Merge operation in accordance with subcategorization properties and the X' schema. As we shall see in the chapter on semantics, deep structure plays a special role in the interpretation of sentences.

The second level of syntactic structure corresponds to the final syntactic form of the

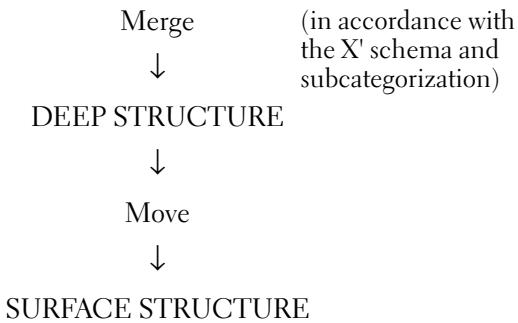


Figure 5.16. How a derivation works.

sentence. Called **surface structure** (or **S-structure**), it results from applying whatever other operations are appropriate for the sentence in question.

3.3 Do Insertion

As we have just seen, formation of *yes-no* questions in English involves moving the I category, and the auxiliary verb that it contains, to the C position. How, then, do we form the questions corresponding to sentences such as those in 31, which contain no auxiliary verb?

- 31) a. The students liked the movie.
b. Those birds sing.

Since the I category in these sentences contains only an abstract tense marker (see Figure 5.17a), applying the Inversion transformation would have no visible effect and there would be no indication that the sentence was being used as a question. English circumvents this problem by adding the special auxiliary verb *do*.

- 32) a. *Did* the students like the movie?
b. *Do* those birds sing?

As these examples show, *do* is inserted into sentences that do not already have an auxiliary verb, thereby making Inversion possible. We can capture this fact by formulating an **insertion rule** that adds an element to a tree structure.

33) **Do Insertion:**

Insert interrogative do into an empty I position.

The sentence in 32b can now be analyzed as shown in Figure 5.17b. As these tree structures show, the sentence *Do those birds sing?* is built in three steps. In the initial step, the Merge operation interacts with the X' schema to give the D-structure in Figure 5.17a, which contains no auxiliary verb in the I position. The Do Insertion rule then adds the special interrogative auxiliary *do*, creating an intermediate level of structure in Figure 5.17b. The Move operation then moves I to the C position, creating the sentence's S-structure in Figure 5.17c.

3.4 Wh Movement

Consider now the set of question constructions exemplified in 34. These sentences are called **wh questions** because of the presence of a question word beginning with *wh*.

- 34) a. Which languages could Aristotle speak?
b. What can the child sit on?

There is reason to believe that the *wh* elements at the beginning of these sentences have been moved there from the positions indicated in Figure 5.18. (We take the question word *which* to be a determiner and *what* to be a noun in these sentences.)

Notice that *which languages* occurs as complement of the verb *speak* while *what* appears as complement of the preposition *on*, in accordance with the subcategorization requirements of these words. As the sentences in 35 show, both *speak* and *on* commonly occur with an NP complement.

- 35) a. Aristotle could speak *Greek*.
b. The child can sit on *the bench*.

The structures in Figure 5.18 capture this fact by treating the *wh* phrase as complement of the verb in the first pattern and complement of the preposition in the second.

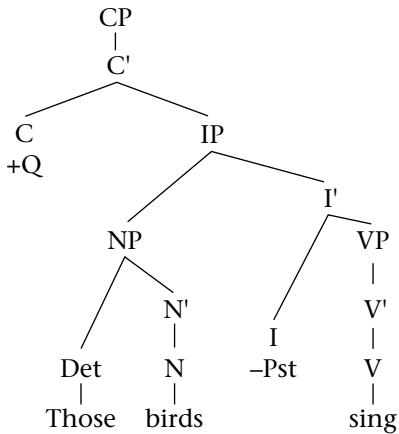
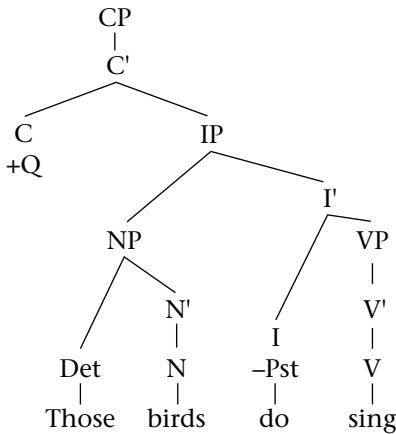
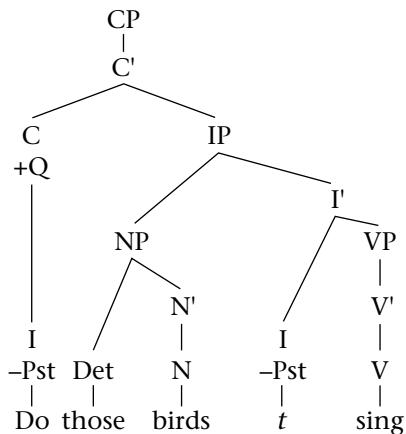
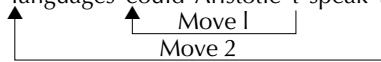
a. D-structure formed by Merge*b. After Do Insertion**c. After Inversion (S-structure)*

Figure 5.17. A sentence formed with the help of *Do Insertion*.

How then do the *wh* phrases end up at the beginning of the sentence? The answer is that they are attracted there by the *Q* feature, which results in the application of a second Move operation. (Recall that we have already posited one Move operation, which we have been calling Inversion.)

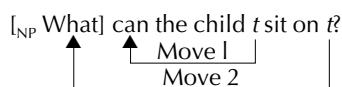
- 36) Which languages could Aristotle *t* speak *t*?



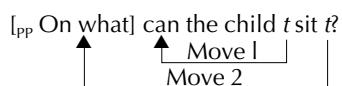
Application of the same two transformations to the structure in Figure 5.18b yields

the *wh* question in 37*a* or 37*b* depending on whether the NP or the PP moves.

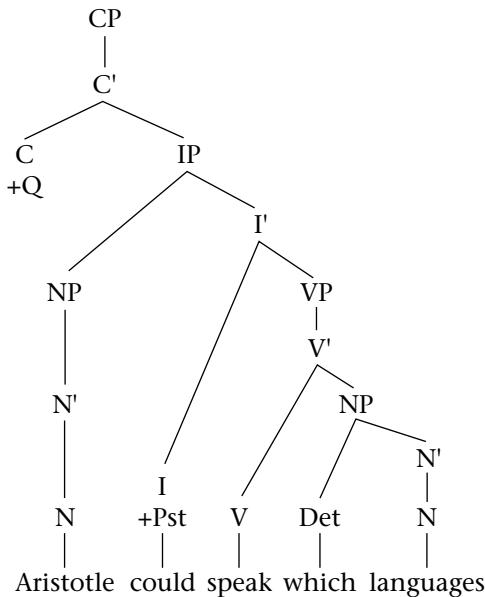
- 37) a. Movement of the NP *what*.



- b. Movement of the PP *on what*:



a.



b.

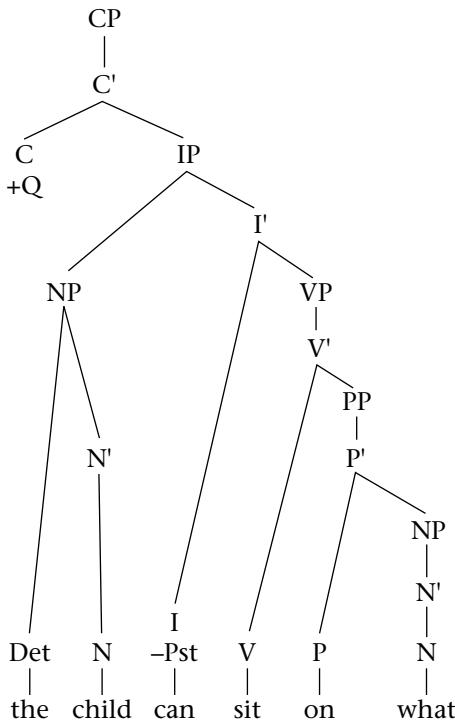


Figure 5.18. D-structures depicting the original positions of the *wh* expressions in 34.

A Landing Site for Wh Words. As the examples in 36 and 37 help illustrate, the Move operation carries the *wh* phrase to the beginning of the sentence, to the left even of the fronted auxiliary. But where precisely does the *wh* phrase land?

Given that the moved auxiliary is located in the C position (see Figure 5.18, for example), it seems reasonable to conclude that the fronted *wh* phrase ends up in the specifier position of CP. Not only is this the only position in syntactic structure to the left of the C, but it is empty prior to the application of the Move operation.

We can make this idea precise by formulating the Move operation that applies to *wh* phrases as follows.

38) **Wh Movement:**

Move a *wh* phrase to the specifier position under CP.

The sentence *Which languages could Aristotle speak?* can now be analyzed in steps, the first of which involves formation of the structure in Figure 5.19 by the Merge operation. Consistent with our earlier assumption, the IP here occurs within a CP shell. *Wh* Movement and Inversion then apply to this structure, yielding the structure in Figure 5.20.

Like other transformations, *Wh* Movement cannot eliminate any part of the previously formed structure. The position initially occupied by the *wh* phrase is therefore not lost. Rather, it remains as a trace (an empty category), indicating that the moved element corresponds to the complement of the verb *speak*.

In the examples considered so far, the *wh* word originates as complement of a verb or preposition. In sentences such as the following, however, the *wh* word asks about the subject (the person who does the criticizing).

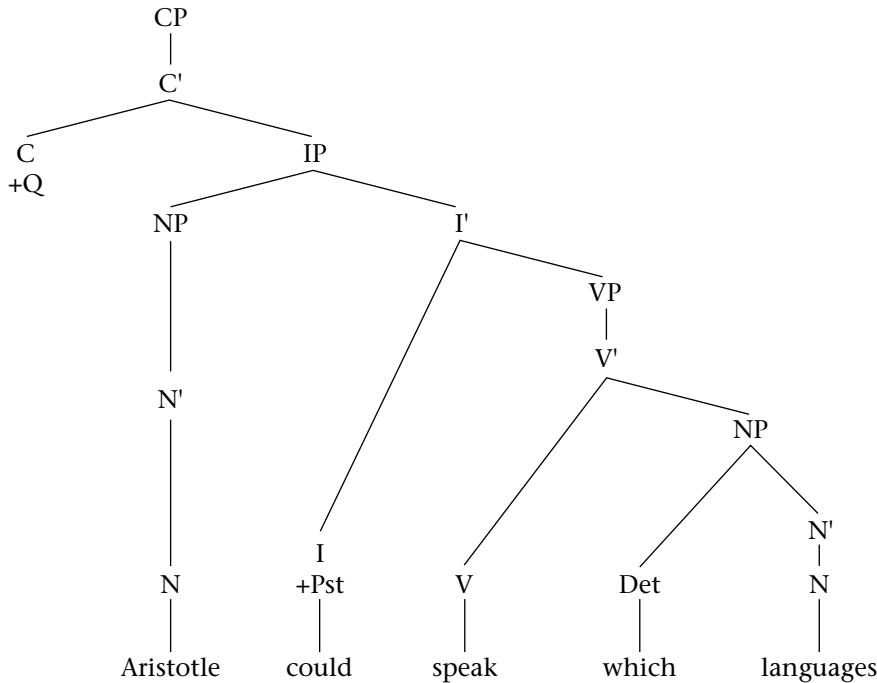


Figure 5.19. Deep structure for *Which languages could Aristotle speak?*

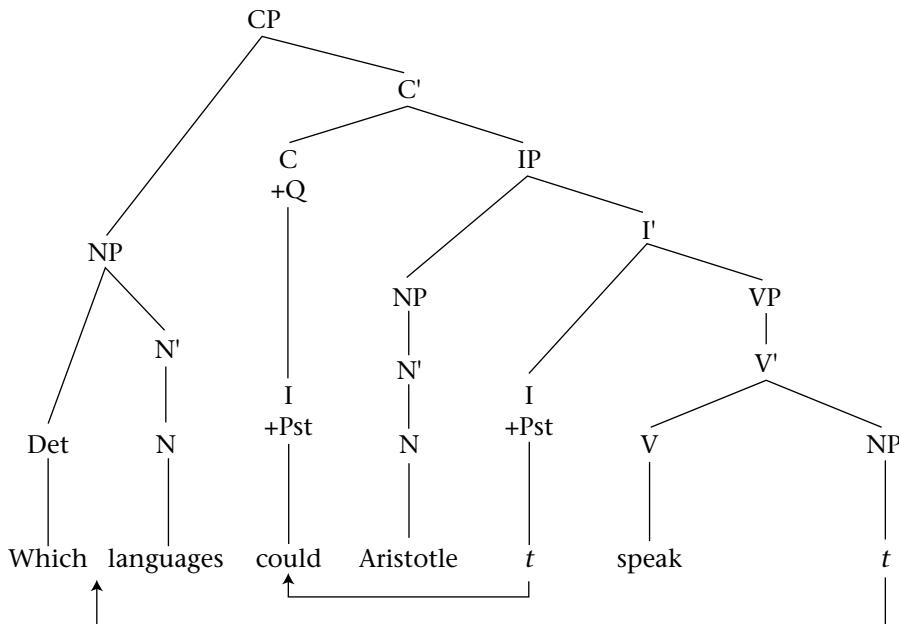


Figure 5.20. Surface structure for *Which languages could Aristotle speak?* The I category moves to the C position and the *wh* phrase moves to the specifier of CP position.

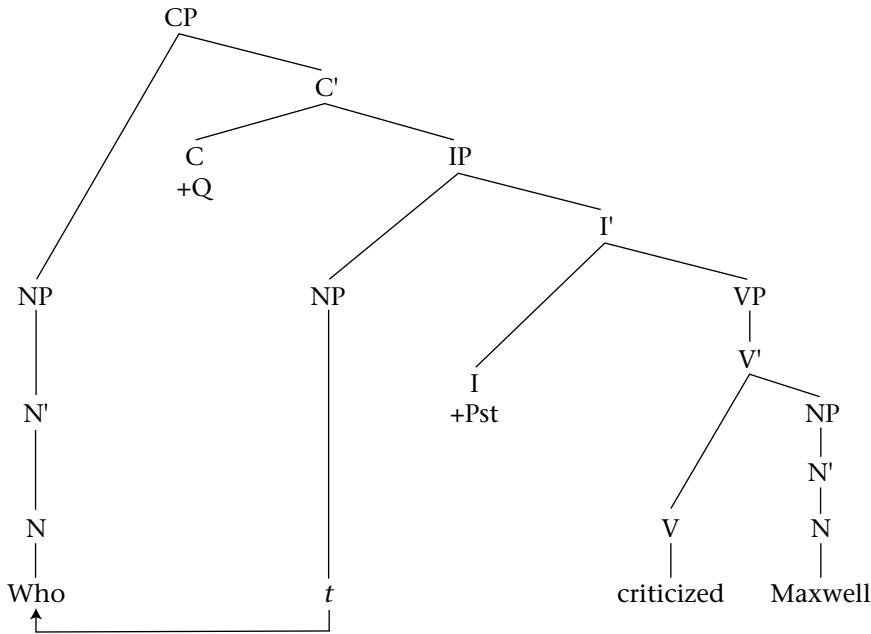


Figure 5.21. Movement of a subject *wh* word. Since there is nothing for the *wh* word to move over in such cases, there is no visible change in word order.

39) Who criticized Maxwell?

In such patterns, the *wh* word originates in the subject position and subsequently moves to the specifier position within CP even though the actual order of the words in the sentence does not change as a result of this movement (see Figure 5.21). (For reasons that are not fully understood, there is no *Do Insertion* in this type of question structure except for purposes of emphasis, as in *Who DID criticize Maxwell?*)

For more about Move, and particularly about limits on its operation, go to bedfordstmartins.com/linguistics/syntax and click on **constraints**.

4 UNIVERSAL GRAMMAR AND PARAMETRIC VARIATION

Thus far, our discussion has focused on English. Before looking at any further phenomena in this language, it is important to extend the scope of our analysis to other languages.

As noted at the beginning of this chapter, recent work on Universal Grammar suggests that all languages are fundamentally alike with respect to the basics of syntax. For instance, all languages use the Merge operation to combine words on the basis of their syntactic category and subcategorization properties, creating phrases that comply with the X' schema.

This does not mean that languages must be alike in all respects, though. Universal Grammar leaves room for variation, allowing individual languages to differ with respect to certain **parameters**. (You can think of a parameter as the set of options that UG permits for a particular phenomenon.) We will consider an example of this now that involves the Move operation. Some additional instances of cross-linguistic differences in syntax are considered at bedfordstmartins.com/linguistics/syntax (click on **variation**) and in Section 2.3 of Chapter 8.

4.1 Verb Raising

Consider the contrast between the following two English sentences.

- 40) a. Paul always works.
 b. *Paul works always.

The ungrammaticality of the second sentence is expected since the preverbal adverb always functions as specifier of the verb and therefore should occur to its left, as in 40a. Surprisingly, however, the equivalent adverb must follow the verb in French, even though specifiers in French normally precede the head, just as they do in English.

- 41) a. The adverb precedes the verb; the sentence is ungrammatical:

*Paul toujours travaille. (= English 40a)
 Paul always works
 ‘Paul always works.’

- b. The adverb follows the verb; the sentence is grammatical:

Paul travaille toujours. (= English 40b)
 Paul works always
 ‘Paul always works.’

Why should this be? One possibility is that the tense feature in the I category somehow attracts the verb to that position in French, just as the Q feature can attract verbs to the C position in some languages. As a result, French has the **Verb Raising transformation** outlined in 42. (It's called “Raising” because the verb moves upward in the tree.)

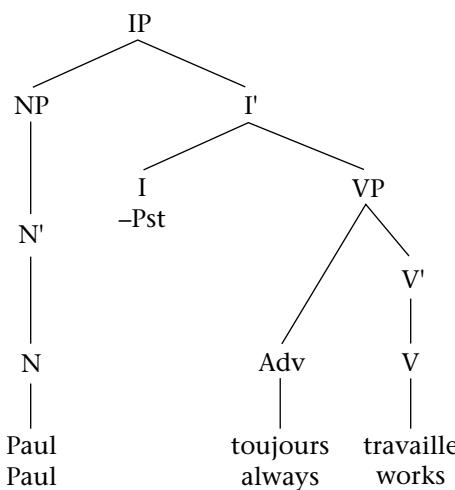
- 42) Verb Raising:

Move V to I.

This Move operation brings about the change depicted in Figure 5.22.

An important piece of independent evidence for the existence of Verb Raising in French comes from the operation of the Inversion transformation. As we have already seen (Section 3.1), this transformation moves the I category to the C position. Now, in English, only auxiliary verbs occur in the I position, which explains why only they can undergo Inversion.

a. Before Verb Raising



b. After Verb Raising

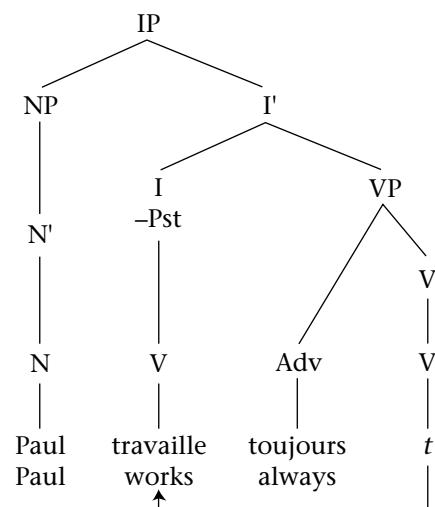


Figure 5.22. Verb Raising in French. The verb moves from within the VP to the I position.

- 43) a. Inversion of an auxiliary verb in English:

Will you *t* stay for supper?



- b. Inversion of a nonauxiliary verb in English:

*Stay you *t* for supper?



In French, however, regular verbs can occur in the I position, thanks to the Verb Raising transformation. This predicts that Inversion should be able to apply to these Vs in French as well as to auxiliaries. This is correct. Like English, French can form a question by moving an auxiliary leftward, as 44 illustrates.

- 44) Inversion of an auxiliary:

As-tu *t* essayé?



'Have you tried?'

However, unlike English, French also allows inversion of nonauxiliary Vs.

- 45) Inversion of a nonauxiliary verb:

Vois-tu *t* le livre?



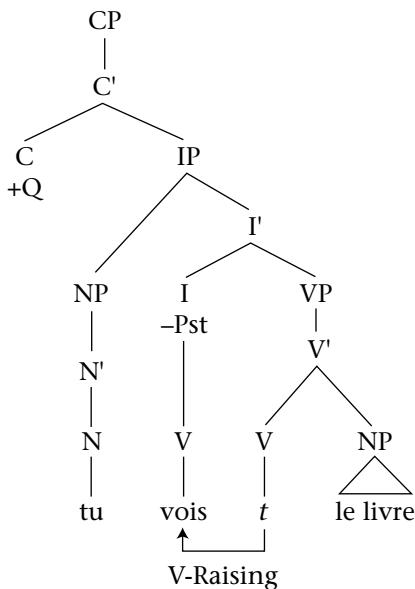
see you the book

'Do you see the book?'

Figure 5.23 depicts the interaction between Verb Raising and Inversion needed to form this sentence. As you can see, the V first raises to the I position, and the I category then moves to the C position. (We treat the pronoun *tu* 'you' as a type of N.)

Verb Raising in English. At this point, it might seem that there is a simple Verb Raising parameter with two options—raising (as in French) and no raising (as in English). This neatly accounts for the facts that we have considered so far, but matters are not so simple. As we'll see next, Verb Raising can apply in English, but only to the nonmodal auxiliaries *have* and *be*.

a. Verb Raising



b. Inversion

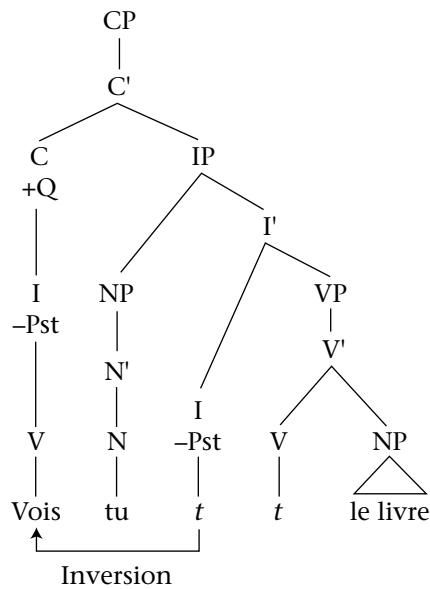


Figure 5.23. The interaction of Verb Raising and Inversion in French.

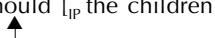
To begin, consider the sentences in 46, which contain two auxiliaries — one **modal auxiliary** and one **nonmodal auxiliary**.

- 46) a. The children should have waited.
 b. Those guys may be sleeping.

As we have already seen, the modal auxiliary occurs under I, but what of the nonmodal auxiliary? As depicted in Figure 5.24, it is considered to be a special type of V that takes a VP complement. As expected, only the modal auxiliary can undergo inversion in this structure.

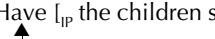
- 47) a. The modal auxiliary moves to the C position:

I_{CP} Should $[I_{IP}$ the children t have waited]]



- b. The nonmodal auxiliary moves to the C position:

* I_{CP} Have $[I_{IP}$ the children should t waited]]



Crucially, however, a nonmodal auxiliary can undergo Inversion when there is no modal auxiliary in the sentence.

- 48) a. The children have waited for two hours.
 b. Have the children t waited for two hours?
- 

Since Inversion involves movement from I to C, the auxiliary *have* must have moved to the I position, as depicted in Figure 5.25 — an instance of the same V Raising operation that is used more generally in French. Once in the I position, *have* can undergo inversion (I-to-C movement), giving the question structure *Have the children waited?*

In sum, then, it appears that the two options permitted by the Verb Raising parameter are: (a) any type of verb raises (the case in French), and (b) only auxiliary verbs raise (the case in English). We discuss other examples of parametric variation, including

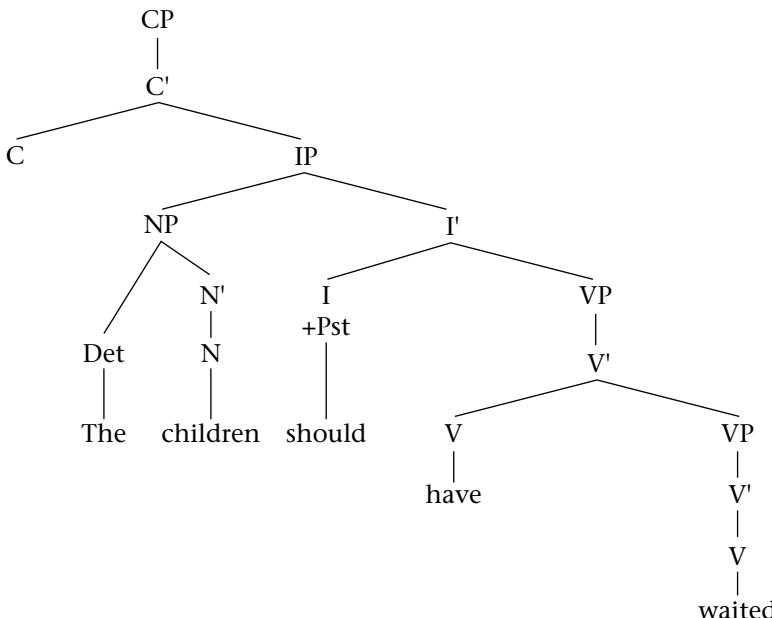


Figure 5.24. A structure containing two auxiliary verbs. The modal auxiliary is treated as an instance of the I category, which takes the VP headed by *have* as its complement. *Have* in turn is a V that takes the VP headed by *wait* as its complement.

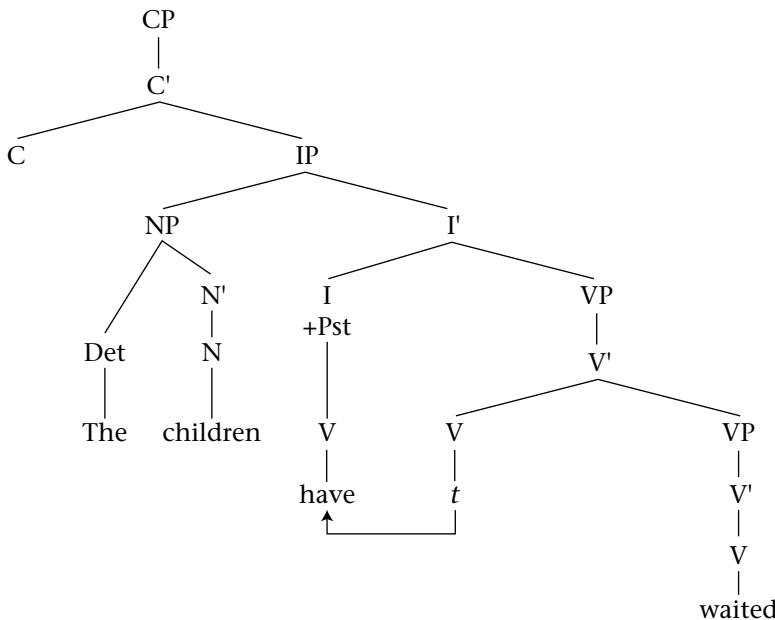


Figure 5.25. The result of V-to-I movement in the sentence *The children have waited.*

another one involving Verb Raising, at bedfordstmartins.com/linguistics/syntax (click on variation).

5 SOME ADDITIONAL STRUCTURES

Now that we have in place a basic system for forming sentences, it is possible to extend it to encompass various other syntactic phenomena. We will consider three such phenomena here.

5.1 Coordination

A common syntactic phenomenon in English and other languages involves **coordination**—the grouping together of two or more categories with the help of a conjunction such as *and* or *or*.

49) coordination involving NPs:

[_{NP} the man] and [_{NP} a child]

50) coordination involving VPs:

[_{VP} go to the library] and [_{VP} read a book]

51) coordination involving PPs:

[_{PP} down the stairs] and [_{PP} out the door]

Coordination exhibits several important properties, three of which will be considered here. First, a category at any level (a head, an X', or an entire XP) can be coordinated. The preceding examples illustrate coordination of XPs; following are examples involving word-level and X'-level categories.

52) coordination involving P:

[_P up] and [_P down] the stairs

53) coordination involving V:

[_V repair] and [_V paint] the deck

54) coordination involving V'

never [_{V'} drink alcohol] and [_{V'} drive a car]

Second, the category of the coordinate structure must be identical to the category of the elements being conjoined. Hence, if NPs are conjoined, the coordinate structure is an NP; if V's are conjoined, the coordinate structure is a V'; if Ps are conjoined, the

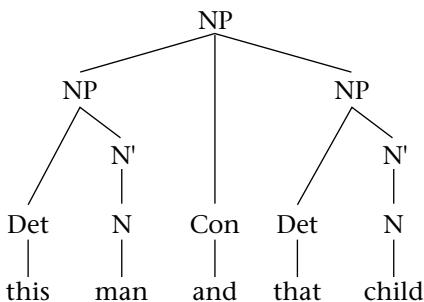
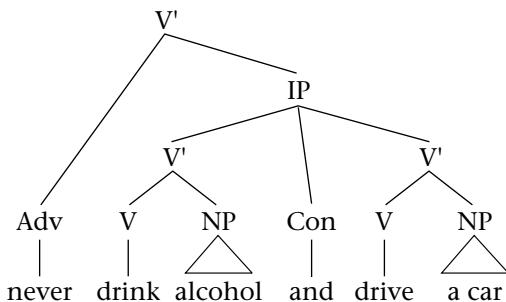
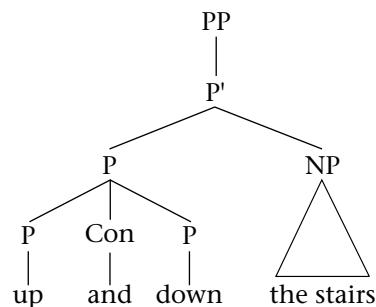
a. Coordination involving NPs:*b. Coordination involving V's:**c. Coordination involving Ps:*

Figure 5.26. Some coordinate structures.

coordinate structure is a P, and so on (see Figure 5.26).

Third, conjoined categories must be of the same type — they must both be NPs, or V's, or Ps, and so on. As 55 shows, coordination that involves different categories generally gives a quite unnatural result.

- 55) a. coordination involving an NP and a PP:
 *He read [_{NP} the book] and [_{PP} in the library]
 b. coordination involving an NP and an AP:
 *He left [_{NP} the house] and [_{AP} very angry]

We can accommodate these facts if we assume that the X' schema is not the only blueprint guiding the Merge operation. There must also be a **coordination schema**, as depicted in Figure 5.27.

The superscripted symbol ⁿ stands for ‘a category at any structural level’, indicating that a coordinate structure can involve Xs, X's, or XPs. Moreover, because the symbol

X is used to stand both for the categories that are conjoined and for the larger resulting phrase, we neatly capture the fact that the conjoined elements and the resulting phrase must all be of the same type.

5.2 Relative Clauses

Another important syntactic phenomenon involves the use of **modifiers** — words and phrases that denote properties of heads. For example, adjective phrases (APs) commonly serve as modifiers of Ns, while adverb phrases (AdvPs) modify Vs.

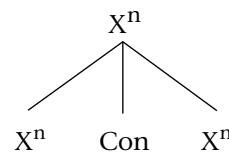


Figure 5.27. The coordination schema.

- 56) a. The [_{AP} very tall] man walked into the room.
 b. The guests left [_{AdvP} rather quickly].

The AP *very tall* denotes a property of the man, while the AdvP describes the manner in which the guests left.

Sometimes even CPs can serve as modifiers. In the following sentence, for instance, a special type of CP called a **relative clause** provides information about the N in front of it.

- 57) a. The car [_{CP} which Leslie bought _] was a lemon.
 b. Harry visited the village [_{CP} which Sue walked to _].

Relative clause structures resemble *wh* questions in two respects. First, they can begin with a *wh* word such as *who* or *which* (a so-called relative pronoun). Second, there is an empty position within the sentence from which the *wh* phrase has apparently been

moved. In sentences 57a and 57b, for instance, the NP positions following the transitive verb *buy* and the preposition *to* are unfilled in S-structure.

The first step in the formation of the relative clause in 57a involves the D-structure in Figure 5.28. Like other modifiers, relative clauses are attached at the XP level; the +Rel feature in the C position indicates that the CP is a relative clause (go to bedfordstmartins.com/linguistics/syntax and click on **modifiers**). (To save space, we give only the structure for the NP containing the relative clause.) Here, the *wh* word *which* occurs as complement of the verb *buy* since it corresponds to the thing which was bought.

The next step involves the application of the *Wh Movement* rule (triggered by the **+Rel feature** in the C position) to give the structure in Figure 5.29, with the *wh* word in the specifier of CP position.

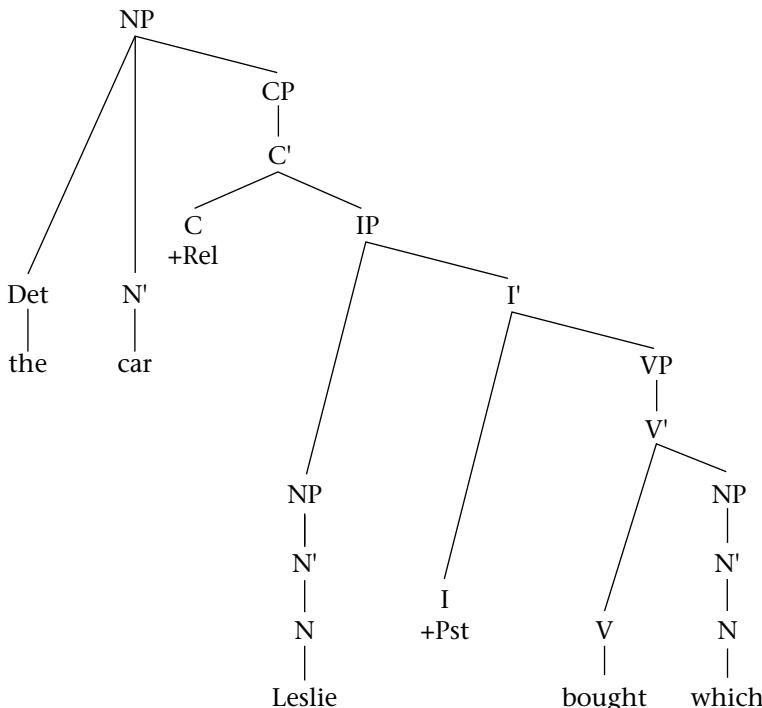


Figure 5.28. The D-structure for a relative clause.

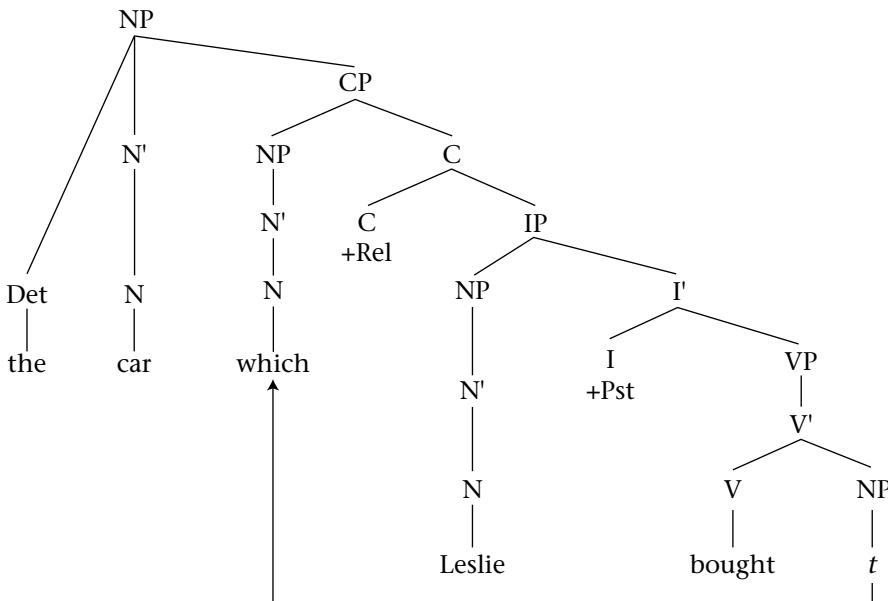


Figure 5.29. The S-structure for a relative clause: the *wh* phrase has moved to the specifier position within CP.

In the preceding example, the *wh* word originates in the direct object position. In 58, in contrast, it originates in the subject position.

- 58) Sue knows the woman [who bought the car].

Here *who* corresponds to the person who bought the car. The deep structure for this sentence therefore corresponds to 59, in which the *wh* word appears in the subject position.

- 59) Sue knows the woman [_{CP} [_{IP} who bought the car]].

Like other *wh* words, *who* subsequently moves to the specifier position within CP even though the actual order of the words in the sentence does not change as a result of this movement.

- 60) Sue knows the woman [_{CP} who [_{IP} _{NP} _t bought the car]].

5.3 Passives

Another important type of syntactic phenomenon involves the relationship between particular sentences. A famous example of this involves sentences such as the following. (The first type of sentence is called **active** because the subject denotes the agent or instigator of the action denoted by the verb, while the second type is called **passive**.)

- 61) a. A thief stole the painting. (active sentence)
 b. The painting was stolen (by a thief).
 (passive sentence)

We will focus here on three key properties of passive constructions.

First, passive constructions involve a major reduction in the importance of the agent. Indeed, whereas the agent serves as subject of an active clause, it is not expressed at all in the vast majority of passive sentences in English.

- 62) The painting was stolen.

When it does appear, as in 61b, it is relegated to a position inside a PP at or near the end of the sentence.

Second, some other NP—usually the direct object of the corresponding active sentence—functions as subject in the passive sentence. This can be seen in example 61 above, where the NP *the painting* serves as direct object in the active sentence and as subject in the passive sentence.

Third, and related to the second point, verbs that cannot occur with a direct object NP in an active sentence typically cannot occur in a passive sentence. Take the verb *arrive*, for instance. It cannot be used in English with an NP complement in an active sentence, nor can it occur in a passive sentence.

- 63) a. *Arrive* with an NP complement in an active sentence:

*The tourist arrived Beijing.

- b. *Arrive* in a passive sentence:

*Beijing was arrived (by the tourist).

The D-structure for a passive sentence such as *The painting was stolen* is depicted in Figure 5.30. (Note that the nonmodal auxiliary *be* is treated as a V that takes a VP complement. To save space, we drop the CP level here. We include an empty specifier position under IP to capture the fact that all sentences require a subject.)

This D-structure is admittedly abstract—it does not sound like any sentence that we actually utter. However, it does neatly capture the first and third properties of passive constructions: the agent is not expressed, and the verb occurs with a direct object. (When the agent is expressed as a PP [e.g., *by a thief*], it is attached under the V' headed by *stolen*.)

This leaves just the second property to be accounted for: the NP that functions as direct object in the active sentence becomes the subject in the passive. This is accomplished by moving the direct object NP to the subject position. The Move operation needed to bring about this result can be stated as follows.

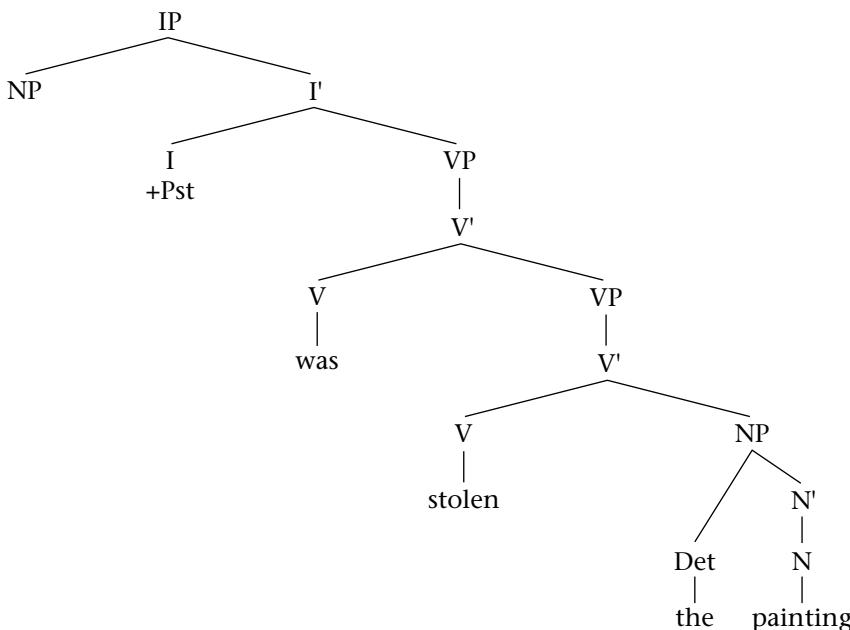


Figure 5.30. D-structure for *The painting was stolen*.

64) NP Movement:

Move NP into the subject position.

This gives the S-structure depicted in Figure 5.31. (Note that the nonmodal auxiliary verb also raises to I for the reasons discussed in Section 4.1.)

The Web site provides additional information about passives and how other approaches to syntax deal with them; go to bedfordstmartins.com/linguistics/syntax and click on **passive**.

Summing Up. Universal Grammar provides all languages with the same general type of syntactic mechanisms. As we have seen, this includes a **Merge** operation that combines words in accordance with their **syntactic category** and their **subcategorization** properties, creating a representation called **deep structure**. Deep structure must comply with the X' schema, which stipulates the place of **heads**, **specifiers**, and **complements** in phrase structure. **Move** operations (**transformations**) can modify deep structure by moving words and phrases in particular ways to produce a **surface structure**.

Although the form of sentences can vary considerably from language to language, such differences can for the most part be attributed to a small set of **parameters**, each of which makes available a variety of alternatives from which individual languages may choose.

For more information on the sources used in this chapter, go to bedfordstmartins.com/linguistics/syntax and click on **Sources**.

RECOMMENDED READING

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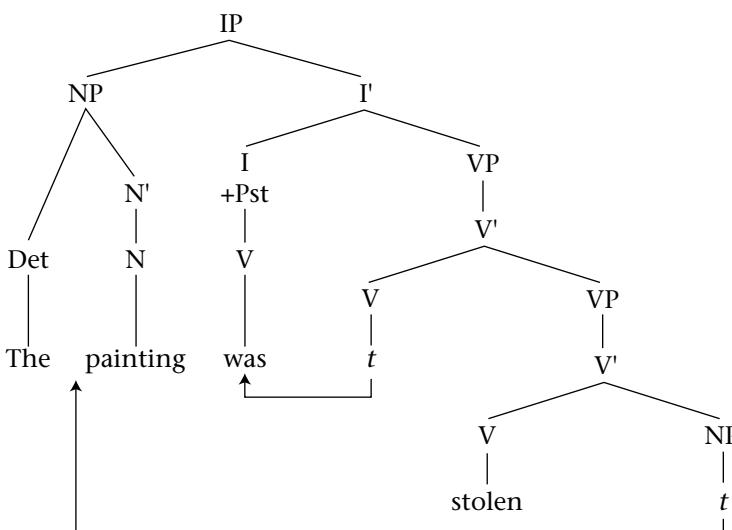


Figure 5.31. S-structure resulting from NP Movement.

Semantics: The Analysis of Meaning

WILLIAM O'GRADY

. . . in every object there is inexhaustible meaning.

—Thomas Carlyle

OBJECTIVES

In this chapter, you will learn:

- how we derive meaning from words and sentences
- how different languages encode concepts in words and sentences
- how we use sentence structure to produce and understand meaning
- how speaker beliefs and attitudes, setting, and context contribute to meaning

Up to now, this book has focused on the form of utterances—their sound pattern, morphological structure, and syntactic organization. But there is more to language than just form. In order for language to fulfill its communicative function, utterances must also convey a message; they must have content. Speaking very generally, we can refer to an utterance's content as its **meaning**.

This chapter is concerned with **semantics**, the study of meaning in human language. Because some work in this complicated area of linguistic analysis presupposes considerable knowledge of other disciplines (particularly logic, mathematics, and philosophy), not all aspects of contemporary semantics are suitable for presentation in an

introductory linguistics textbook. We will restrict our attention here to four major topics in semantics: (1) the nature of meaning, (2) some of the properties of the conceptual system underlying meaning, (3) the contribution of syntactic structure to the interpretation of sentences, and (4) the role of nongrammatical factors in the understanding of utterances.

1 THE NATURE OF MEANING

Long before linguistics existed as a discipline, thinkers were speculating about the nature of meaning. For thousands of years, this question has been considered central to philosophy. More recently, it has come to be important in other disciplines as well, including of course linguistics and psychology. Contributions to semantics have come from a diverse group of scholars, ranging from Plato and Aristotle in ancient Greece to Bertrand Russell in the twentieth century. Our goal in this section will be to consider in a very general way what this research has revealed about meaning in human language. We will begin by considering some of the basic analytic notions used in evaluating the meanings of words and sentences.

1.1 Semantic Relations among Words

Words and phrases can enter into a variety of semantic relations with each other. Because

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Table 6.1 Some Synonyms in English

| | |
|------------|------------|
| filbert | hazelnut |
| youth | adolescent |
| automobile | car |
| remember | recall |
| purchase | buy |
| big | large |

Table 6.2 Some Antonyms in English

| | |
|------|-------|
| dark | light |
| boy | girl |
| hot | cold |
| up | down |
| in | out |
| come | go |

these relations help identify those aspects of meaning relevant to linguistic analysis, they constitute a good starting point for this chapter.

Synonymy. **Synonyms** are words or expressions that have the same meaning in some or all contexts. The following pairs of words in Table 6.1 provide plausible examples of synonymy in English. Because it would be inefficient for a language to have two words or phrases with absolutely identical meanings, perfect synonymy is rare, if not impossible. For example, although *youth* and *adolescent* both refer to people of about the same age, only the latter word can be used to imply immaturity, as in *Such irresponsible behavior—what an adolescent!*

Antonymy. **Antonyms** are words or phrases that are opposites with respect to some component of their meaning. The pairs of words in Table 6.2 provide examples of antonymy.

In each of these pairs, the two words contrast with respect to at least one aspect of their meaning. For instance, the meanings of *boy* and *girl* are opposites with respect to gender, although they are alike in other respects (both are human). Similarly, *come* and *go* are opposites with respect to direction, although both involve the concept of movement.

Polysemy and Homophony. Polysemy occurs where a word has two or more related meanings. Table 6.3 contains some examples of polysemous words in English.

If you consult a reasonably comprehensive dictionary for any language, you will find numerous examples of polysemy. For example, my dictionary lists several related meanings for the word *mark*.

- 1) Polysemy in the meaning of *mark*.
 - a visible trace or impression on something (*The tires left a mark on the road.*)
 - a written or printed symbol (*You need a punctuation mark here.*)
 - a grade, as in school (*He got a good mark on the math test.*)
 - a target (*She hit the mark every time.*)
 - an indication of some quality or property (*The mark of a good diplomat is the ability to negotiate.*)

Homophony exists where a single form has two or more entirely distinct meanings (see Table 6.4). In such cases, it is assumed that there are separate words with the same pronunciation rather than a single word with different meanings. Homophones sound the same but need not have identical

Table 6.3 Some Polysemy in English

| Word | Meaning a | Meaning b |
|-----------|-------------------------|---------------------|
| bright | 'shining' | 'intelligent' |
| to glare | 'to shine intensely' | 'to stare angrily' |
| a deposit | 'minerals in the earth' | 'money in the bank' |

Table 6.4 Some Homophones in English

| Word | Meaning a | Meaning b |
|-------|---------------------------|--|
| light | 'not heavy' | 'illumination' |
| bank | 'a financial institution' | 'a small cliff at the edge of a river' |
| club | 'a social organization' | 'a blunt weapon' |
| pen | 'a writing instrument' | 'an enclosure' |

spellings — *write* and *right* are homophones, as are *piece* and *peace*.

Polysemy and homophony create **lexical ambiguity**, in that a single form has two or more meanings. Thus, a sentence such as 2 could mean either that Liz purchased an instrument to write with or that she bought an enclosure.

- 2) Liz bought a *pen*.

Of course, in actual speech, the surrounding words and sentences usually make the intended meaning clear. The lexical ambiguity in sentences such as the following therefore normally goes unnoticed.

- 3) He got a loan from the *bank*.
 4) Because Liz needed a place to keep her goat, she went downtown and bought a *pen* for \$100.

The most lexically ambiguous item in English may well be *set*, which has more than 150 entries in the *Oxford English Dictionary*.

1.2 Semantic Relations Involving Sentences

Like words, sentences have meanings that can be analyzed in terms of their relation to other meanings. Three such relations — paraphrase, entailment, and contradiction — are particularly important.

Paraphrase. Two sentences that can have the same meaning are said to be **paraphrases** of each other. The following pairs of sentences provide examples of paraphrase.

- 5) a. The police chased the burglar.
 b. The burglar was chased by the police.
 6) a. I gave the summons to Erin.
 b. I gave Erin the summons.
 7) a. It is unfortunate that the team lost.
 b. Unfortunately, the team lost.
 8) a. Paul bought a car from Sue.
 b. Sue sold a car to Paul.
 9) a. The game will begin at 3:00 p.m.
 b. At 3:00 p.m., the game will begin.

The *a* and *b* sentences in each of the above pairs are obviously very similar in meaning. Indeed, it would be impossible for one sentence to be true without the other also being true. Thus, if it is true that the police chased the burglar, it must also be true that the burglar was chased by the police. (Sentences whose meanings are related to each other in this way are said to have the same **truth conditions** — that is, they are true under the same circumstances.)

For some linguists, this is enough to justify saying that the two sentences have the same meaning. However, you may notice that there are subtle differences in emphasis between the *a* and *b* sentences in 5 through 9. For instance, it is natural to interpret 5*a* as a statement about what the police did and 5*b* as a statement about what happened to the burglar. Similarly, 9*b* seems to place more emphasis on the starting time of the game than 9*a* does. As is the case with synonymy, many linguists feel that languages do not permit two or more structures to have absolutely

identical meanings and that paraphrases are therefore never perfect.

Entailment. When the truth of one sentence guarantees the truth of another sentence, we say that there is a relation of **entailment**. This relation is mutual in the case of examples 5 to 9, since the truth of either sentence in the pair guarantees the truth of the other. In examples such as the following, however, entailment is asymmetrical.

- 10) a. The park wardens killed the bear.
b. The bear is dead.
- 11) a. Prince is a dog.
b. Prince is an animal.

If it is true that the park wardens killed the bear, then it must also be true that the bear is dead. However, the reverse does not follow since the bear could be dead without the park wardens having killed it. Similarly, if it is true that Prince is a dog, then it is also true that Prince is an animal. Once again, though, the reverse does not hold: even if we know that Prince is an animal, we cannot conclude that he is a dog rather than a horse or a cat.

Contradiction. Sometimes it turns out that if one sentence is true, then another sentence must be false. This is the case with the examples in 12.

- 12) a. Charles is a bachelor.
b. Charles is married.

If it is true that Charles is a bachelor, then it cannot be true that he is married. When two sentences cannot both be true, we say that there is a **contradiction**.

1.3 What Is Meaning?

Although it is relatively easy to determine whether two words or sentences have identical or different meanings, it is much more

difficult to determine precisely what meaning is in the first place. In fact, despite many centuries of study, we still know very little about the nature of meaning or how it is represented in the human mind. Nonetheless, it is worthwhile to review briefly some of the better-known proposals and the problems that they encounter.

Connotation. One notion that is closely linked with the concept of meaning is **connotation**, the set of associations that a word's use can evoke. For most Minnesotans, for example, the word *winter* evokes thoughts of snow, bitter cold, short evenings, frozen finger tips, and the like. These associations make up the word's connotation, but they can not be its meaning (or at least not its entire meaning). The word *winter* does not become meaningless just because it is a mild year or because one moves to Florida in November. We must therefore look beyond connotation for our understanding of what meaning is.

Denotation. One well-known approach to semantics attempts to equate the meaning of a word or phrase with the entities to which it refers—its **denotation**, or **referents**. The denotation of the word *winter*, for example, corresponds to the season between autumn and spring (regardless of whether it is cold and unpleasant). Similarly, the denotation of the word *dog* corresponds to the set of canines, and so on.

Although a word's denotation is clearly connected to its meaning in some way, they cannot be one and the same thing. This is because there are words such as *unicorn* and phrases such as *the present king of France* that have no referents in the real world, even though they are far from meaningless.

A problem of a different sort arises with expressions such as *the Prime Minister of Britain* and *the leader of the Labour Party*,

Table 6.5 Extension versus Intension

| Phrase | Extension | Intension |
|---------------------------|------------------------|---|
| prime minister of Britain | Tony Blair | leader of the governing party |
| World Series champions | Florida Marlins (2003) | winners of the World Series Championship |
| capital of Missouri | Jefferson City | city containing the state legislature |

both of which refer (in 2004, at least) to Tony Blair. Although these two expressions may have the same referent, it seems wrong to say that they mean the same thing. Thus, we would not say that the phrase *Prime Minister of Britain* is defined as ‘the leader of the Labour Party’ or that the definition of the phrase *leader of the Labour Party* is ‘Prime Minister of Britain’.

Extension and Intension. The impossibility of equating an element’s meaning with its referents has led to a distinction between **extension** and **intension**. Whereas an expression’s extension corresponds to the set of entities that it picks out in the world (its referents), its intension corresponds to its inherent sense, the concepts that it evokes. Thus, the extension of *woman* is a set of real world entities (women) while its intension involves notions like ‘female’ and ‘human’. Similarly, the phrase *Prime Minister of Britain* has as its extension an individual (Tony Blair), but its intension involves the concept ‘leader of the governing party’ (see Table 6.5). The distinction between intension and extension does not allow us to resolve the question of what meaning is. It simply permits us to pose it in a new way: what are intensions?

One suggestion is that intensions correspond to mental images. This is an obvious improvement over the referential theory, since it is possible to have a mental image of a unicorn or even the king of

France, although there are no such entities in the real world. However, problems arise with the meanings of words such as *dog*, which can be used to refer to animals of many different sizes, shapes, and colors. If the meaning of this word corresponds to a mental image, that image would have to be general enough to include Chihuahuas and St. Bernards, yet still exclude foxes and wolves. If you try to draw a picture that satisfies these requirements, you will see just how hard it is to construct an image for meanings of this sort.

Componential Analysis. Still another approach to meaning tries to represent a word’s intension by breaking it down into smaller semantic components. Sometimes known as **componential analysis** or **semantic decomposition**, this approach has often been used to analyze the meaning of certain types of nouns in terms of semantic features. The analysis in Figure 6.1 for the words *man*,

| | |
|---------------|--------------|
| <i>man:</i> | <i>boy:</i> |
| [+HUMAN] | [+HUMAN] |
| [+MALE] | [+MALE] |
| [+ADULT] | [-ADULT] |
| <i>woman:</i> | <i>girl:</i> |
| [+HUMAN] | [+HUMAN] |
| [-MALE] | [-MALE] |
| [+ADULT] | [-ADULT] |

Figure 6.1 Semantic feature composition for *man*, *woman*, *boy*, *girl*.

woman, *boy*, and *girl* illustrates how this works. (Nothing depends on the choice of feature names here; the analysis would work just as well with the feature \pm female as \pm male.) An obvious advantage of this approach is that it allows us to group entities into natural classes (much as we do in phonology). Hence, *man* and *boy* could be grouped together as [+human, +male] while *man* and *woman* could be put in a class defined by the features [+human, +adult].

This in turn can be useful for stating generalizations of various sorts. For instance, there are certain verbs, such as *marry*, *argue*, and the like, that we expect to find only with subjects that are [+human]. Moreover, within the English pronoun system, *he* is used to refer to [+human] entities that are [+male] while *she* is used for [+human] entities that are [−male].

There are limits on the insights into word meaning offered by componential analysis. What value, for example, is there in characterizing the meaning of *dog* as [+animal, +canine] as long as there is no further analysis of these features? Similarly, do we say that the meaning of *blue* consists of the feature [+color] and something else? If so, what is that other thing? Isn't it blueness? If so, then we have not really broken the meaning of *blue* into smaller components, and we are back where we started.

To date, componential analysis has given its most impressive results in the study of verb meaning. A typical component of verb meaning is the concept GO, which is associated with change of various sorts. (The components of verb meaning tend not to be binary features. We use uppercase letters to represent a semantic concept.)

13) manifestations of the concept GO:

a. positional change:

Harvey went from Austin to New Orleans.

b. possessorial change:

The inheritance went to Maria.

c. identificational change:

Max went from being a rational gentleman to being a stark raving lunatic.

Despite their somewhat different senses, all three uses of the verb go have something in common that can be traced to the GO component of their meaning—they typically occur with a phrase that denotes the entity (i.e., the subject in these examples) undergoing change and with a phrase expressing the endpoint of that change (the *to* complements).

The GO concept is manifested in the meaning of verbs other than just go. For instance, positional GO is present in the meaning of *fly* 'go through the air', *walk* 'go on foot', *crawl* 'go on hands and knees', and so forth. Possessorial GO is manifested in the meaning of *give*, *buy*, and *inherit*, all of which involve a change of possession, while identificational GO shows up in *become* and *turn into*. Because these verbs all share the abstract GO meaning, they are all typically used with a phrase denoting the entity undergoing the change (marked in 14 by a single underline) and a phrase denoting the endpoint of that change (marked by a double underline).

14) a. positional GO:

The bird flew to its nest.

b. possessorial GO:

The coach gave a new ball to the children.

c. identificational GO:

The caterpillar turned into a butterfly.

Verb Meaning and Subcategorization.

Sometimes quite surprising features of verb meaning can be relevant to the choice of accompanying phrases. Consider, for instance, the contrast between the verbs in list *a*, which can occur with two NP

complements, and the verbs in list *b*, which cannot.

- 15) a. throw [_{NP} the boy] [_{NP} the package]
 toss
 kick
 fling
 b. *push [_{NP} the boy] [_{NP} the package]
 *pull
 *lift
 *haul

Can you see the semantic difference? The verbs in list *a* all denote ballistic motion that results from the instantaneous application of force to an object at its point of origin. (When we throw something, for example, we thrust it forward and then release it.) In contrast, the verbs in list *b* all denote motion that is accompanied by the continuous application of force to the object as it moves from one point to another. (Pulling, for instance, typically involves the extended use of force as the object moves, rather than a single quick motion.)

Now think about the contrast between the following two sets of verbs.

- 16) a. fax [_{NP} Helen] [_{NP} the news]
 radio
 e-mail
 phone
 b. *murmur [_{NP} Helen] [_{NP} the news]
 *mumble
 *mutter
 *shriek

Once again, componential analysis reveals a subtle semantic contrast. The first group of verbs (*phone*, *radio*, etc.) have meanings that include the means by which a message was communicated (by phone, by radio, and so on). In contrast, the verbs in the second group all have meanings that describe the type of voice that was used to communicate the message (*murmuring*, *mumbling*, *shriek-*

ing, etc.). For reasons that are not yet fully understood, meaning differences like these help determine the type of complements that particular verbs can select.

2 THE CONCEPTUAL SYSTEM

Underlying the use of words and sentences to express meaning in human language is a conceptual system capable of organizing and classifying every imaginable aspect of our experience, from inner feelings and perceptions, to cultural and social phenomena, to the physical world that surrounds us. This section focuses on what the study of this conceptual system reveals about how meaning is expressed through language. We will begin by considering some examples that illustrate the way in which these concepts are structured, extended, and interrelated.

2.1 Fuzzy Concepts

We tend to think that the concepts expressed by the words and phrases of our language have precise definitions with clear-cut boundaries. Some concepts may indeed be like this. For example, the concept expressed by the word *senator* seems to have a clear-cut definition: one is a senator if and only if one is duly elected to a particular legislative body; no other person can be truthfully called a senator.

But are all concepts so straightforward? Consider the concept associated with the word *rich*. How much does a person have to be worth to be called rich? Five hundred thousand dollars? Eight hundred thousand? A million? Is there any figure that we can give that would be so precise that a person who is short by just five cents would not be called rich? It seems not. While one could miss out on being a senator by five votes, it does not seem possible to miss out on being rich by just five cents. Moreover, whereas some

people clearly qualify as rich and others uncontroversially do not, an indefinitely large number of people fall into the unclear area at the borderline of the concept, and it is just not possible to say definitively whether or not they count as rich. This is because the notion of ‘richness’ does not have clear-cut boundaries; it is what we call a **fuzzy concept**.

This type of fuzziness pervades the human conceptual system. With only a little effort, you should be able to think of many everyday concepts whose boundaries are fuzzy—TALL, OLD, PLAYBOY, STRONG, GRAY-HAIRED, GENIUS, CLEAN, and BARGAIN are just a few examples.

Graded Membership. A second important fact about concepts is that their members can be **graded** in terms of their typicality. Consider first a fuzzy concept such as BASEBALL STAR. Even within the set of people who we can agree are baseball stars, some provide better examples of this concept than others. At the time of this writing, for instance, Alex Rodriguez is a better example

of a baseball star than is Derrick Jeter. Although baseball fans agree that both players are stars, Alex Rodriguez has hit more runs, won more awards, set more records, endorsed more products on TV, received more media attention, and so on. This makes him a better example of a star than Derrick Jeter.

Even concepts whose boundaries can be scientifically defined exhibit this type of graded membership. A good example of this involves the concept BIRD, as shown in Figure 6.2 [below]. Even assuming that all English speakers think of birds as ‘warm-blooded, egg-laying, feathered vertebrates with forelimbs modified to form wings’ (the dictionary definition), they still feel that some of these creatures are more birdlike than others. For instance, robins and magpies are intuitively better examples of birds than are hummingbirds, ostriches, or penguins. Examples like these suggest that concepts have an internal structure, with the best or **prototypical** exemplars (Alex Rodriguez in the case of BASEBALL STARS, robins in the case of BIRDS) close to the core

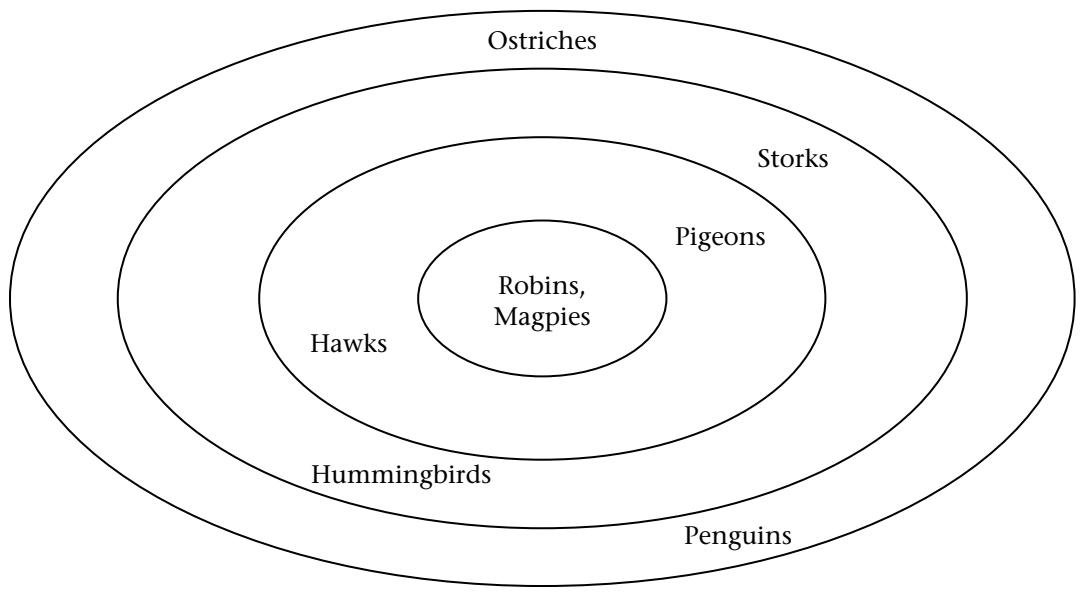


Figure 6.2. Internal structure of the concept BIRD.

and less typical members arranged in successively more peripheral regions.

The existence of fuzzy concepts and of graded membership provides important insights into the nature of the human conceptual system. In particular, it seems that many (perhaps even most) concepts expressed in language are not rigid all-or-nothing notions with precise and clear-cut boundaries. Rather, they are characterized by an internal structure that recognizes degrees of typicality as well as by fuzzy boundaries that sometimes overlap with those of other concepts.

2.2 Metaphor

The concepts expressed by language make up a giant network, with many interconnections and associations. A good example of these interconnections involves **metaphor**, the understanding of one concept in terms of another.

Many people think of metaphor as a literary device reserved for the use of authors and poets. In fact, however, it has a prominent place in the conceptual system shared by all human beings. This can be seen in the way that we use language to talk about even commonplace notions such as 'time.'

The dominant metaphor for talking about time involves treating it as if it were a concrete commodity that can be saved, wasted, and invested, just like other valuable things.

- 17) a. You're *wasting* my time.
 b. This gadget will *save* you hours.
 c. How do you *spend* your time these days?
 d. I have *invested* a lot of time in that project.
 e. You need to *budget* your time.
 f. Is that *worth* your while?
 g. He's living on *borrowed* time.
 h. You don't use your time *profitably*.

What is the basis for this metaphor? There is apparently no objective, inherent similar-

ity between time and commodities such as gold or money. What brings these concepts together is the *perception*, based in part on culture and in part on feelings that all human beings share, that time is like a valuable commodity that can be gained and lost.

A Spatial Metaphor. Another very prevalent metaphor in our language involves the use of words that are primarily associated with spatial orientation to talk about physical and psychological states (see Table 6.6).

The basis for these **spatial metaphors** appears to lie in our physical experience. Unhappiness and ill health tend to be associated with lethargy and inactivity, which often involve being on one's back (physically down). In contrast, happiness and good health are often correlated with energy and movement, which involve being on one's feet (physically up).

These few examples illustrate the point that the concepts expressed through language are interrelated in special and intriguing ways. By investigating phenomena such as the use of metaphor to represent abstract concepts in terms of more basic physical and cultural experience, we can gain valuable insights into how language is used to communicate meaning.

2.3 The Lexicalization of Concepts

Do all human beings share the same conceptual system? Do all languages express concepts in the same way? These are questions that have fascinated and puzzled researchers for many decades. At the present time, there is no reason to believe that human beings in different linguistic communities have different conceptual systems. But there is ample evidence that languages can differ from each other in terms of how they express particular concepts.

Table 6.6. Metaphorical Use of Spatial Terms

Emotions: happy is *up*; sad is *down*

| | |
|---------------------------------|-----------------------------------|
| I'm feeling <i>up</i> . | I'm feeling <i>down</i> . |
| That <i>boosted</i> my spirits. | He <i>fell</i> into a depression. |
| My spirits <i>rose</i> . | Her spirits <i>sank</i> . |
| You're in <i>high</i> spirits. | He's feeling <i>low</i> . |
| the <i>height</i> of ecstasy | the <i>depths</i> of depression |
| That gave me a <i>lift</i> . | |

Physical health: health and life are *up*; sickness and death are *down*

| | |
|------------------------------------|---|
| He's at the <i>peak</i> of health. | He's <i>sinking</i> fast. |
| Lazarus <i>rose</i> from the dead. | He <i>fell</i> ill. |
| He's in <i>top</i> shape. | He came <i>down</i> with the flu. |
| | Her health is <i>declining</i> . |
| | She's feeling <i>under</i> the weather. |

Lexicalization. A notorious example of how languages can supposedly differ from each other in the expression of concepts involves the number of words for snow in Inuktitut. Some times estimated to be in the hundreds, the number is actually much smaller. In fact, one dictionary gives only the four items in Table 6.7 (although other dictionaries give a few more, at least for some varieties of Inuktitut).

As you can see, there is nothing particularly startling about this list of words. In fact, even in English there is more than just one word to describe snow in its various forms — *snow, slush, blizzard, and sleet* come to mind.

These examples illustrate the phenomenon of **lexicalization**, the process whereby concepts are encoded in the words of a language. Inuktitut lexicalizes the concepts ‘falling’ and ‘snow’ in a single word (*qana*),

Table 6.7 Words for ‘Snow’ in Inuktitut

| | |
|------------------|----------------------|
| <i>aput</i> | ‘snow on the ground’ |
| <i>qana</i> | ‘falling snow’ |
| <i>piqsirpoq</i> | ‘drifting snow’ |
| <i>qimuqsuq</i> | ‘snow drift’ |

while English uses two separate words. While some lexicalization differences may correlate with cultural factors (the relative importance of types of snow in traditional Inuit culture), this is not always so. For example, English has an unusually rich set of vocabulary items pertaining to the perception of light (see Table 6.8). Although English speakers know and use the words in this list, it is hard to see how the variety found in this particular area of vocabulary can be correlated with any significant feature of culture.

As we have tried to emphasize throughout this book, linguistic analysis focuses on the system of knowledge that makes it possible to speak and understand a language. The fact

Table 6.8 Some Verbs Pertaining to Light in English

| | |
|---------|---------|
| glimmer | glisten |
| gleam | glow |
| glitter | flicker |
| shimmer | shine |
| flare | glare |
| flash | sparkle |

Table 6.9 Some Verbs Expressing Motion and Manner in English

| |
|---|
| The rock <i>rolled</i> down the hill. |
| The puck <i>slid</i> across the ice. |
| She <i>limped</i> through the house. |
| The smoke <i>swirled</i> through the opening. |

that a particular language has more words pertaining to snow or light does not in and of itself provide any insight into the nature of the human linguistic system, and therefore does not merit special attention. However, as we shall see in the next subsection, certain lexicalization differences do shed light on how language expresses meaning.

Motion Verbs. All languages have words that can describe motion through space (in English, *come*, *go*, and *move*, among many others). However, there are systematic differences in terms of how languages express motion and the concepts related to it. In English, for example, there are many verbs that simultaneously express both the concept of motion and the manner in which the motion occurs (see Table 6.9). Notice how each of these verbs expresses both the fact that something moved and the manner in which it moved (by rolling, sliding, limping, and so on). We describe this fact by saying that En-

glish lexicalization includes a **conflation pattern** that combines manner and motion into a single verb meaning.

Interestingly, Romance languages (descendants of Latin) cannot express motion events in this way. Thus, while Spanish has a verb *rodar* with the meaning ‘to roll’, it does not use this verb to express both manner and motion as English does.

- 18) *La botella rodó en la cueva.

‘The bottle rolled into the cave.’

Instead, the motion and its manner have to be expressed separately.

- 19) La botella entró en la cueva, rodando.

‘The bottle entered the cave, rolling.’

Although Spanish does not have the motion plus manner conflation pattern, it does have verbs whose meanings bring together the concepts of motion and path (see Table 6.10). As the English translations show, Spanish verbs of motion express both the concept of movement and the direction of its path—down, up, back, across, out, and so forth. (English too has verbs that can express both motion and path—*descend*, *ascend*, *return*, and so on—but these words are not part of its native vocabulary. Rather, they were borrowed into English from Latinate sources, usually through French.)

Table 6.10 Some Verbs Expressing Motion and Path in Spanish

| | | |
|----------|-------------|---|
| El globo | <i>bajó</i> | por la chimenea. ‘The balloon moved-down through the chimney.’ |
|----------|-------------|---|

| | | |
|----------|--------------|---|
| El globo | <i>subió</i> | por la chimenea. ‘The balloon moved-up through the chimney.’ |
|----------|--------------|---|

| | | |
|------------|---------------|--|
| La botella | <i>volvió</i> | a la orilla. ‘The bottle moved-back to the bank.’ |
|------------|---------------|--|

| | | |
|------------|--------------|---|
| La botella | <i>cruzó</i> | el canal. ‘The bottle moved-across the canal.’ |
|------------|--------------|---|

| | | |
|------------|--------------|---|
| La botella | <i>salió</i> | de la cueva. ‘The bottle moved-out from the cave.’ |
|------------|--------------|---|

Table 6.11 Some Verb Roots Expressing Motion and the Thing Moving in Atsugewi

| | |
|-------------|--|
| <i>lup</i> | for movement of a small, shiny, spherical object (a hailstone) |
| <i>t</i> | for movement of a smallish, flat object that can be attached to another (a stamp, a clothing patch, a shingle) |
| <i>caq</i> | for movement of a slimy, lumpish object (a toad, a cow dropping) |
| <i>swal</i> | for movement of a limp linear object, suspended by one end (a shirt on a clothesline, a hanging dead rabbit) |
| <i>qput</i> | for movement of loose, dry dirt |
| <i>staq</i> | for movement of runny, unpleasant material (manure, guts, chewed gum, rotten tomatoes) |

Yet another conflation pattern is found in the Amerindian language Atsugewi (spoken in northern California), in which verbs can express both motion and the type of thing that moves (see Table 6.11).

We learn two things from these facts. First, the concept of motion is associated with a number of other concepts, including ‘path’, ‘manner of movement’, and ‘moving thing’. Second, the way in which these concepts are combined for the purposes of lexicalization can differ systematically from language to language. Languages such as English have verbs that conflate motion and manner, while other languages have verbs that conflate motion and path (Spanish) or motion and the type of thing that moves (Atsugewi).

The general picture that is emerging from this type of work is consistent with the key idea underlying componential analysis (Section 1.3). In particular, it seems that at

least within certain semantic domains, there may be a small universal set of concepts (motion, manner, path, thing that moves, and so on) and a small set of options for how these concepts can be combined for purposes of lexicalization (see Figure 6.3). Unlike the lexicalization differences involving snow and light discussed earlier, these differences appear to be highly systematic and to reveal some general tendencies about the organization of the human conceptual system and the way in which meaning is expressed in language.

2.4 Grammaticization

Of the indefinitely large set of concepts expressible in human language, a relatively small subset enjoys a special status. These are the concepts that are expressed as affixes and nonlexical (functional) categories in one language or another. Some of the

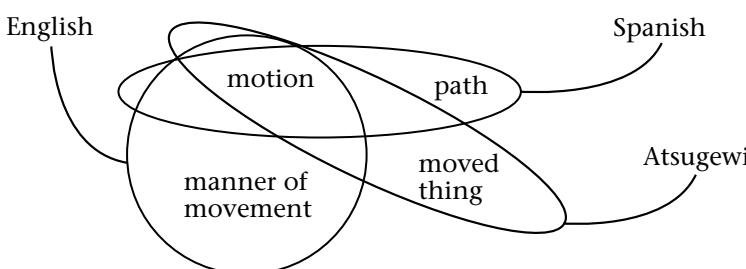


Figure 6.3. Systematic differences in conflation patterns.

Table 6.12 Some Concepts Associated with Affixes and Nonlexical Categories in English

| Concept | Affix |
|-------------------------|---------------------|
| Past | -ed |
| More than one | -s |
| Again | re- |
| Negation | in-, un- |
| Concept | Nonlexical Category |
| Obligation | must |
| Possibility | may |
| Definite, specific | the |
| Indefinite, nonspecific | a |
| Disjunction | or |
| Negation | not |
| Conjunction | and |

concepts that are treated this way in English are listed in Table 6.12.

Concepts that are expressed as affixes or nonlexical categories are said to have been **grammaticalized**. Some concepts, such as negation, tense, and number, are highly grammaticalizable and are expressed as affixes or special nonlexical categories in most languages. But grammaticalization is not re-

stricted to just these familiar concepts, as we will see next.

Evidentiality in Hidatsa. In the Siouan language Hidatsa, each statement is accompanied by a morpheme to indicate the evidence for its truth (see Table 6.13). (Morphological contrasts of this sort express **evidentiality**.)

Choice of the appropriate sentence-enders is extremely important in Hidatsa. Speakers who utter a false sentence marked by the morpheme *-ski* are considered to be liars. Had they used the morpheme *-c*, on the other hand, it would be assumed that they simply made a mistake.

While English has ways of indicating these contrasts (by using expressions such as *perhaps*, *I heard that*, and *I guess*), it does not have a grammatical system of morphemes that obligatorily encodes this information in every sentence. By investigating the grammaticalization options found in different languages, it may eventually be possible to identify the factors that determine which concepts are singled out for association with affixes and nonlexical categories.

Table 6.13 Evidentiality Morphemes in Hidatsa

| | |
|---------------|---|
| <i>ski</i> | THE SPEAKER IS CERTAIN OF THE STATEMENT'S TRUTH Waceo iikipi kure heo <u>-ski</u> . 'The man (definitely) carried the pipe.' |
| <i>c</i> | THE SPEAKER BELIEVES THE STATEMENT TO BE TRUE Waceo iikipi kure heo <u>-c</u> . 'The man (supposedly) carried the pipe.' |
| <i>wareac</i> | THE SPEAKER REGARDS THE STATEMENT TO BE COMMON KNOWLEDGE Waceo iikipi kure heo <u>-wareac</u> . 'The man carried the pipe (they say).' |
| <i>rahe</i> | THE STATEMENT IS BASED ON AN UNVERIFIED REPORT FROM SOMEONE ELSE Waceo wiira rackci heo <u>-rahe</u> . 'The man roasted the goose (it is rumored).' |
| <i>toak</i> | THE TRUTH OF THE STATEMENT IS UNKNOWN TO BOTH SPEAKER AND LISTENER Waceo cihipa rakci heo <u>-toak</u> . 'The man roasted the prairie dog (perhaps).' |

3 SYNTAX AND SENTENCE INTERPRETATION

The two preceding sections have focused on the meaning conveyed by the individual words and phrases that make up a sentence. In this section, we turn to the problem of sentence interpretation, with an emphasis on how the positioning of words and phrases in syntactic structure helps determine the meaning of the entire sentence, consistent with the following principle.

20) The Principle of Compositionality:

The meaning of a sentence is determined by the meaning of its component parts and the manner in which they are arranged in syntactic structure.

Syntactic structure is relevant to meaning in a variety of ways. For purposes of illustration, we will consider four aspects of its contribution to the interpretation of sentences—constructional meaning, the representation of structural ambiguity, the assignment of thematic roles, and the interpretation of pronouns.

3.1 Constructional Meaning

There is reason to believe that structural patterns are themselves capable of carrying meaning above and beyond the meaning of their component parts. One example of this **constructional meaning** can be seen in “the caused-motion construction” exemplified in 21.

- 21) a. Seymour pushed the truck off the table.
- b. Mabel moved the car into the garage.
- c. Perry pulled the dog into the swimming pool.

As these examples help illustrate, the caused-motion construction consists of a structural pattern (NP V NP PP) that is used to express the meaning ‘X causes Y to go somewhere’. Thus, the first sentence describes a situation in which Seymour causes

the truck to go off the table by pushing it; the second sentence is used for situations in which Mabel causes the car to go into the garage; and so on.

22) *The caused-motion construction*

Form: NP V NP PP

Meaning: ‘X causes Y to go somewhere’

Striking evidence for the existence of a constructional meaning comes from sentences such as the following.

- 23) a. Boris sneezed the handkerchief right across the room.
- b. The judges laughed the poor guy out of the room.
- c. Morley squeezed the shirt into the suitcase.

There is clearly nothing in the meaning of verbs such as *sneeze*, *laugh*, and *squeeze* that implies caused motion. Yet when they occur in the NP V NP PP pattern, the resulting sentence has a meaning in which X causes Y to go somewhere. Thus, sentence 23a means that Boris caused the handkerchief to fly across the room by sneezing; 23b means that the judges forced someone out of the room by laughing at him; and so on.

How can this be? It seems that part of the meaning of these sentences comes from the construction itself: in 23a, for instance, the verb *sneeze* provides the meaning ‘involuntarily expel air from the mouth and nose’, while the structural pattern tells us that this action caused the handkerchief to be propelled across the room. Without both types of information, the sentence could not mean what it does.

Another example of constructional meaning can be found in patterns such as the following.

- 24) a. Jerry sent Lou a present.
- b. The company gave its employees a bonus.
- c. The secretary handed Mary a message.
- d. Marvin threw Harry the ball.

These sentences are instances of the so-called ditransitive construction that is typically associated with the meaning 'X causes Y to have Z'. Thus 24a, for instance, describes a situation in which Jerry causes Lou to have a present by sending it to her.

25) *The ditransitive construction*

Form: NP V NP NP

Meaning: 'X causes Y to have Z'

An indication that the structure itself contributes part of the meaning associated with ditransitive constructions comes from sentences such as *Jerry baked Lou a cake*. This sentence describes a situation in which Lou ends up with a cake, even though there is clearly nothing in the meaning of *bake* that implies that one person causes another person to have something. This part of the sentence's meaning comes from the structure itself—another example of constructional meaning.

3.2 Structural Ambiguity

Some sentences are structurally ambiguous in that their component words can be combined in more than one way. A simple example of this is found in the phrase *wealthy men and women*, where *wealthy* can be seen

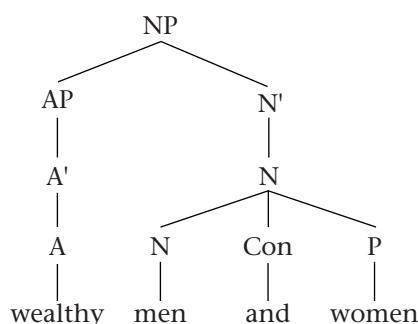
as a property of both the men and the women or of just the men alone. These two interpretations or **readings** are depicted in Figure 6.4 (Con = conjunction). Figure 6.4a corresponds to the reading in which *wealthy* modifies both *men* and *women*. This is shown by having the adjective combine with a category that includes both nouns. In Figure 6.4b, on the other hand, the adjective combines only with the N *men*. This structure corresponds to the reading in which *wealthy* applies only to the men.

Another case of structural ambiguity is found in sentences such as the following.

26) Nicole saw people with binoculars.

In one interpretation of 26, the people had binoculars when Nicole noticed them (the phrase *with binoculars* modifies the noun *people*); in the other interpretation, Nicole saw the people by using the binoculars (the PP modifies the verb). These two readings are represented in Figure 6.5. In Figure 6.5a, the PP with binoculars occurs inside the NP headed by the N *people*, reflecting the first reading for this sentence. In Figure 6.5b, on the other hand, the PP is part of the VP headed by the verb *saw*. This corresponds to the interpretation in which *with binoculars* describes how Nicole saw the people.

a.



b.

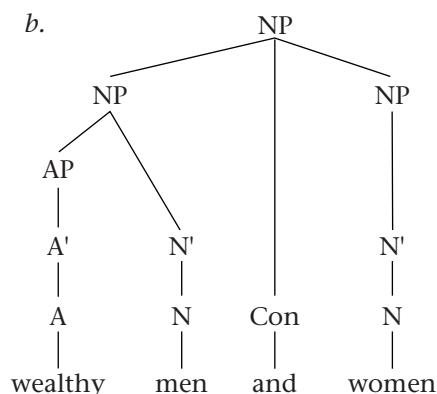
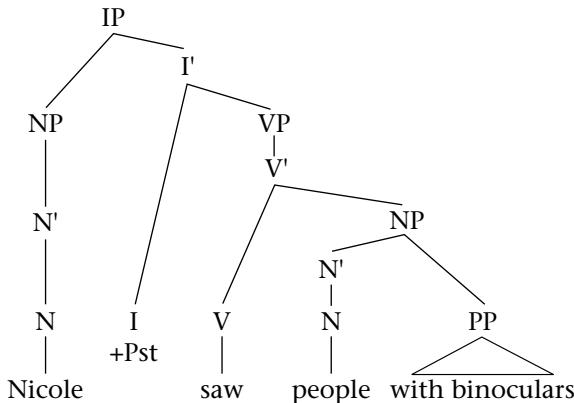


Figure 6.4. An ambiguous phrase. The structure on the left indicates that both the men and the women are wealthy; the structure on the right indicates that only the men are wealthy.

a.



b.

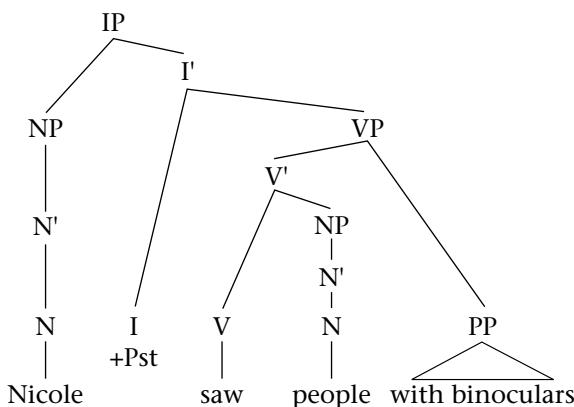


Figure 6.5. An ambiguous sentence. In the first structure, the people have the binoculars; in the second structure, Nicole uses the binoculars to see the people.

In sum, the manner in which words are grouped together in syntactic structure reflects the way in which their meanings are combined. Sometimes, as in the examples we have just considered, identical strings of words can be combined in either of two ways, creating structural ambiguity that can be neatly captured with the help of tree structures.

3.3 Thematic Roles

Another aspect of semantic interpretation involves determining the role that the referents of NPs play in the situations described

by sentences. Consider in this regard the sentence in 27.

- 27) The courier carried the document from Boston to Seattle.

It would be impossible to understand this sentence if we could not identify the courier as the person who is responsible for carrying something, the document as the thing that is carried, Boston as the point of origin, and Seattle as the destination. Linguists often use **thematic roles** to categorize the relation between a sentence's parts and the event that it describes. In most linguistic analyses, at least

Table 6.14 Thematic Roles

| | |
|----------|---|
| Agent | the entity that performs an action |
| Theme | the entity undergoing an action or a movement |
| Source | the starting point for a movement |
| Goal | the end point for a movement |
| Location | the place where an action occurs |

the following thematic roles are recognized (see Table 6.14).

Examples of these thematic roles can be seen in sentences such as the following.

- 28) a. The courier carried the document from
agent *theme*

Boston to Seattle.

source *goal*

- b. The athletes practiced in the Astrodome.
agent *location*

The notion of movement used in the definition of **theme**, **source**, and **goal** is intended to involve not only actual physical motion but also changes in possession, as in 29, and identity, as in 30.

- 29) Terry gave the skis to Mary.
agent *theme* *goal*

- 30) The magician changed the ball into a rabbit.
agent *theme* *goal*

As you may recall, we observed a similar set of contrasts in the manifestation of the GO concept discussed in Section 1.3. This is no coincidence. Thematic roles can be traced to particular aspects of word meaning, and the presence of GO in a verb's meaning is specifically linked to the presence of a theme role and a goal role.

Thematic Role Assignment. How does the grammar ensure that the appropriate thematic role is associated with each NP in a sentence? As we have just seen, thematic roles originate in word meaning. Thus, if the sentence *Marvin purchased a pen at the bookstore* contains an **agent** and a theme, it

Table 6.15 Some Words and the Thematic Roles Implied by Their Meanings

| | |
|-----------------|----------------|
| <i>purchase</i> | <agent, theme> |
| <i>walk</i> | <agent> |
| <i>to</i> | <goal> |
| <i>from</i> | <source> |
| <i>at</i> | <location> |

is because the verb *purchase* has the type of meaning that implies an entity that does the purchasing (an agent) and an entity that gets purchased (a theme). Similarly, *the bookstore* is taken to denote the **location** of the action because of the meaning of the preposition *at*. Information about the thematic roles assigned by a particular lexical item is recorded in a **thematic grid**, as depicted in Table 6.15.

The thematic roles implied by the meanings of lexical items are assigned to NPs based on their position in syntactic structure, with each NP receiving a single role. As a first example of this, let us consider the complement of a preposition. In such cases, the process of thematic role assignment can be summarized as follows:

- 31) A P assigns a thematic role to its complement NP.

The operation of this convention is illustrated in Figure 6.6.

Matters are slightly more complicated in the case of Vs. Here we must distinguish between the theme role, which is assigned to the verb's complement, and the agent role, which is assigned to its subject.

- 32) A V assigns a theme role (if it has one) to its complement NP.

A V assigns an agent role (if it has one) to its subject NP.

This is exemplified in the structures in Figure 6.7. In accordance with 32, the theme (th) role is assigned to the V's NP complement,

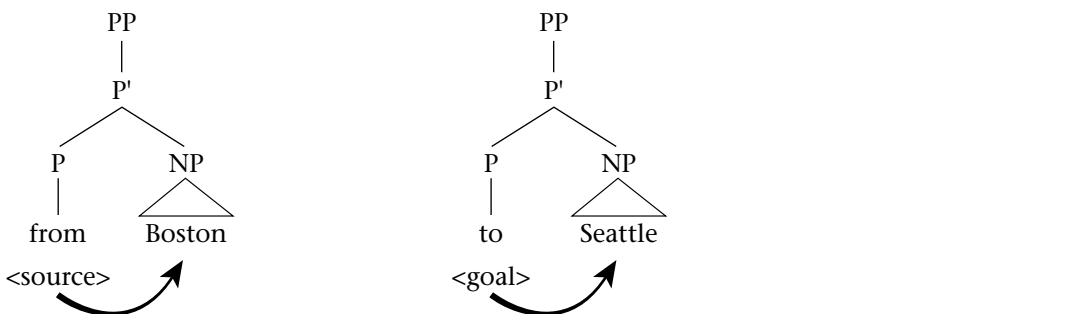


Figure 6.6. Thematic role assignment by prepositions.

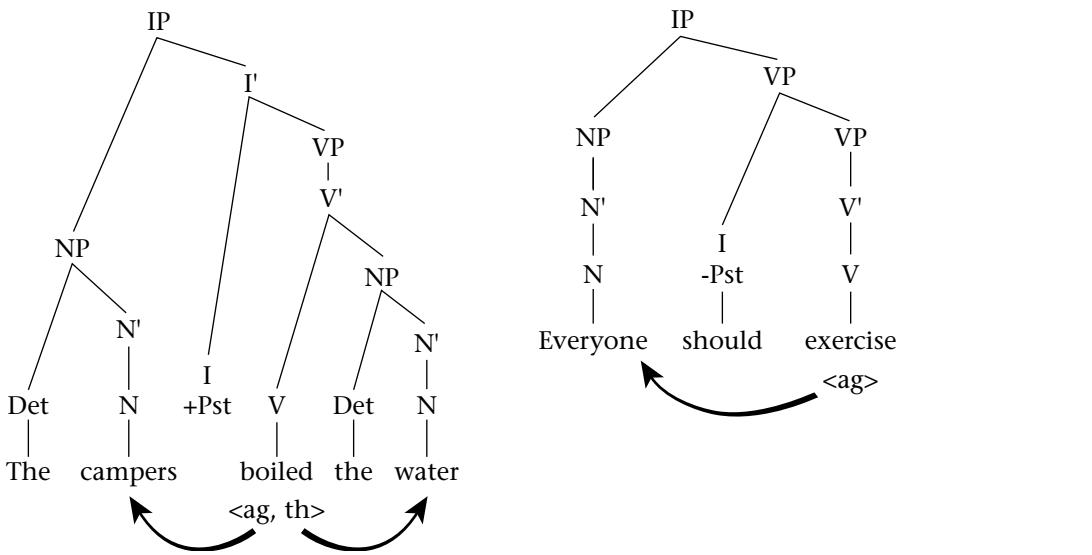


Figure 6.7. Thematic role assignment by verbs.

while the agent (ag) role is assigned to its subject.

The structure in Figure 6.8 illustrates the assignment of thematic roles in a sentence that contains a P in addition to a V. Here, the P *at* assigns its location (loc) role to its complement NP (*the bookstore*), while the verb *purchase* assigns its theme role to the complement *a pencil* and its agent role to the subject *Marvin*.

Deep Structure and Thematic Roles

In the examples considered to this point, it is unclear whether an NP receives its the-

matic role on the basis of its position in deep structure or surface structure. This is because our example sentences are all formed without the help of the Move operation, so that each NP occupies the same position in both deep structure and surface structure. But now consider a sentence such as 33, which is formed with the help of Wh Movement.

33) Which book should the students read?

This sentence has the deep structure depicted in Figure 6.9. Since the theme role is assigned to the complement of V, it follows that the NP *which book* in the above

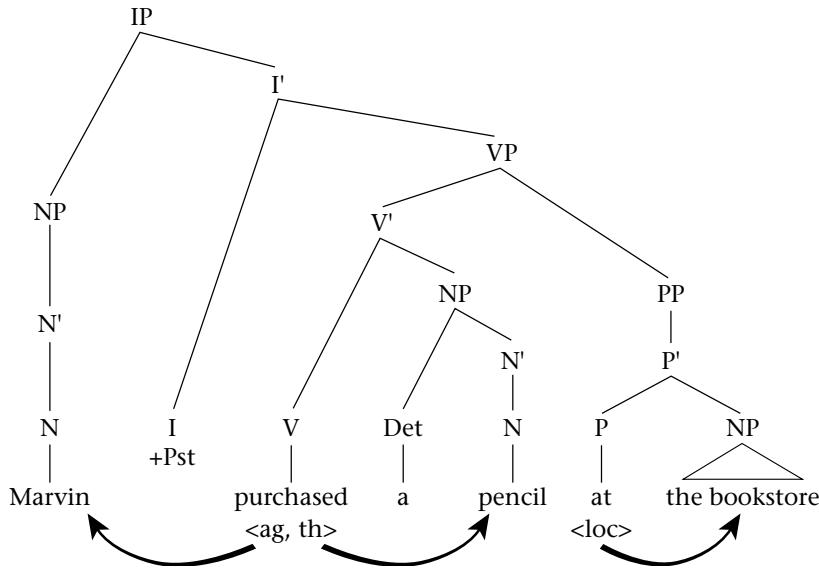
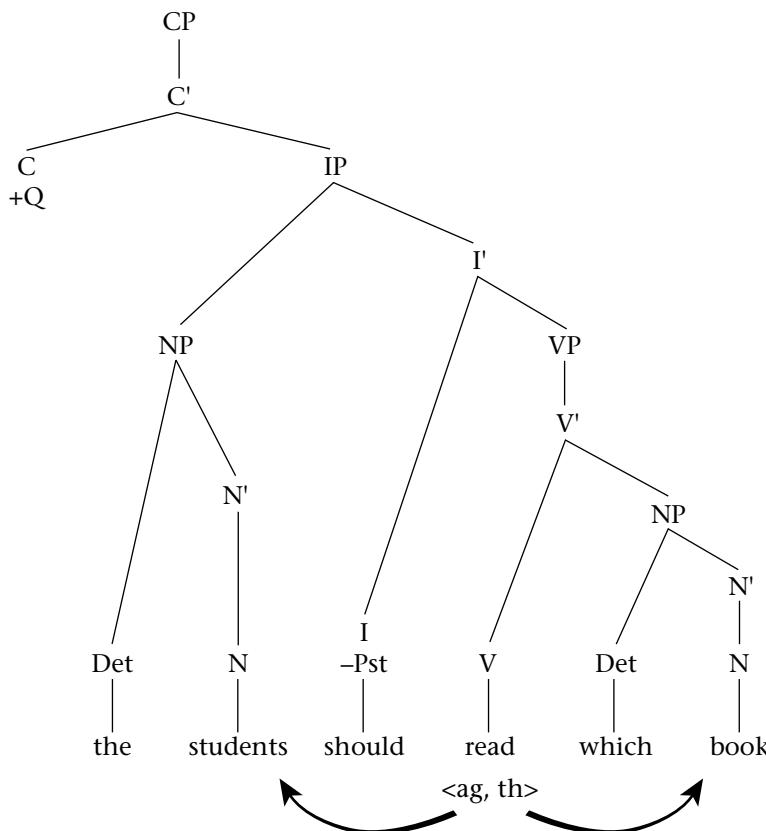


Figure 6.8. Thematic role assignment in a complex sentence.

b.

Figure 6.9. Thematic role assignment in a *wh*-question.

example receives this role by virtue of its position in deep structure, not surface structure (where it occurs in the specifier of CP position).

In sum, an NP's initial position in syntactic structure (the result of the Merge operation) determines its thematic role. The Move operation may subsequently transport the NP to another position (as is the case with *wh* words), but the original thematic role remains unchanged. The relationship between syntactic structure and the part of a sentence's meaning represented by thematic roles is thus very intricate, reflecting the structural relations manifested in deep structure rather than position in surface structure.

3.4 The Interpretation of Pronouns

Syntactic structure also has an important role to play in the interpretation of pronouns, including pronominals such as *he*, *him*, *she*, and *her* and reflexive pronouns such as *himself* and *herself* (see Table 6.16). A defining property of pronouns is that their interpretation can be determined by another element, called the **antecedent**. As the following sentences help show, pronominals and reflexive pronouns differ in terms of where their antecedents can occur.

- 34) a. [_{I_P} Claire knew that [_{I_P} Alexis trusted *her*]].
 b. [_{I_P} Claire knew that Alexis trusted *herself*]].

Notice that *her* can refer either to Claire or to someone not mentioned in the sentence,

Table 6.16 Subject and Object Pronouns in English

| | Pronominals | | Reflexives | |
|------------|---------------------------|--------|------------------------------|------------|
| | SG | PL | SG | PL |
| 1st person | I, me | we, us | myself | ourselves |
| 2nd person | you | you | yourself | yourselves |
| 3rd person | he, him she, her it | they | himself herself itself | themselves |

but that *herself* refers only to Alexis. This reflects the fact that a reflexive pronoun must typically have an antecedent in the smallest IP containing it.

A somewhat more abstract feature of syntactic structure enters into the interpretation of the reflexive pronouns in sentences such as 35, which has the tree structure shown in Figure 6.10. (Pronouns are treated as N-type categories that head NPs; to save space, some word-level category labels are omitted. Possessor NPs occur in the specifier position within larger NPs.)

- 35) That boy's teacher admires himself.

Although there are two NPs in the same IP as *himself* (namely, *that boy* and *that boy's teacher*), only one (*that boy's teacher*) can serve as antecedent for the reflexive pronoun. Thus, the person who is admired in 35 must have been the boy's teacher, not the boy.

Principles A and B. The principle needed to ensure this interpretation makes use of the notion **c-command**, which is defined as follows.

- 36) NP_a c-commands NP_b if the first category above NP_a contains NP_b.

Although c-command might appear to be a rather technical notion, the underlying idea is very simple. Figure 6.11 illustrates the type of configuration in which c-command occurs. When trying to determine c-command relations, you can either use the definition in

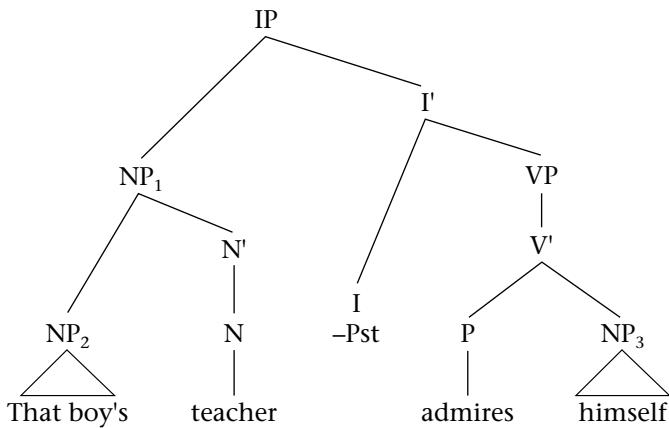


Figure 6.10. Structure containing a reflexive pronoun.

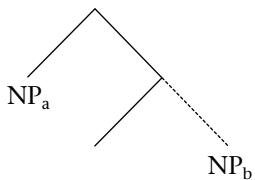


Figure 6.11. The c-command configuration.

36 or apply the template in Figure 6.11 to the tree structure being analyzed.

We can now formulate the constraint on the interpretation of reflexives, called **Principle A**, as follows. (The “minimal IP” is just the smallest IP containing the pronoun.)

37) *Principle A*

A reflexive pronoun must have an antecedent that c-commands it in the same minimal IP.

When using Principle A, the key step involves determining whether a potential antecedent c-commands the reflexive pronoun. Compare in this regard the status of the NPs *that boy* and *that boy's teacher* in Figure 6.12. Since the first category above the NP *that boy's teacher* (namely, IP) contains the reflexive, this NP c-commands *himself* according to our definition and can therefore serve as its antecedent. As we have

already seen, the sentence has this interpretation.

Now let us consider the interpretation of pronominals. As the following example shows, the interpretation of the pronominal *him* contrasts sharply with that of the reflexive *himself* in the structure that we have been considering. Thus, *him* can refer to the boy, but not to the boy's teacher—the opposite of what we observed for *himself*.

- 38) That boy's teacher admires him.

How are we to account for these facts? The relevant constraint, called **Principle B**, is stated in 39.

39) *Principle B*

A pronominal must not have an antecedent that c-commands it in the same minimal IP.

To see how this principle works, consider the structure in Figure 6.13. In this structure, NP₁ (*that boy's teacher*) c-commands *him* since the first category above it (namely, IP) also contains *him*. Principle B therefore prevents NP₁ from serving as antecedent for *him*. In contrast, NP₂ (*that boy's*) does not c-command *him* since the first category above it (namely,

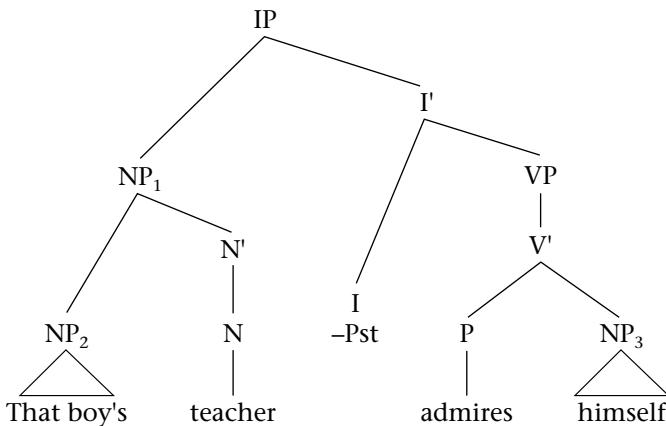


Figure 6.12. Structure illustrating c-command relations. NP_1 c-commands NP_3 but NP_2 does not.

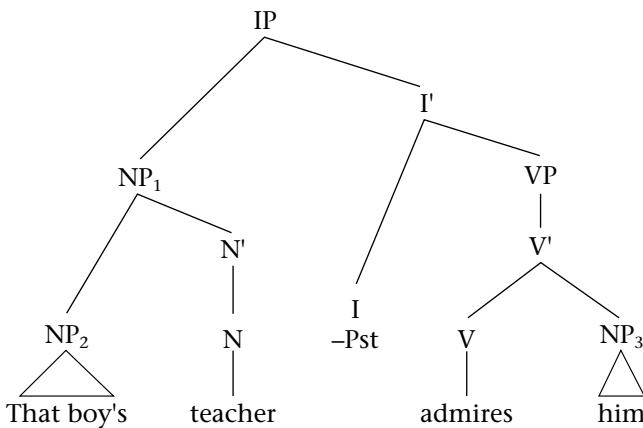


Figure 6.13. Structure containing a pronominal.

NP_1) does not contain the pronoun. Thus, nothing prevents the interpretation in which *him* and *that boy* refer to the same person.

There is much more that can and should be said about the interpretation of pronouns. However, the examples we have just considered suffice to illustrate the crucial point in all of this, which is that syntactic structure plays an important role in the interpretation of both pronominals and reflexive pronouns. For more on this subject, go to bedfordstmartins.com/linguistics/semantics and click on **pronouns**.

4 OTHER FACTORS IN SENTENCE INTERPRETATION

Syntactic structure provides only some of the information needed to interpret a sentence. Other necessary information comes from **pragmatics**, which includes the speaker's and addressee's background attitudes and beliefs, their understanding of the context in which a sentence is uttered, and their knowledge of how language can be used to inform, to persuade, to mislead, and so forth. This section focuses on the role of pragmatics in sentence interpretation.

4.1 The Role of Beliefs and Attitudes

As we saw in the preceding section, the grammar includes a structural principle (Principle B) that regulates the interpretation of pronominals such as *he* and *they*. However, as the following sentences show, nonlinguistic knowledge and beliefs can also play an important role in selecting the antecedent for a pronominal.

- 40) a. The judge denied the prisoner's request because he was cautious.
 b. The judge denied the prisoner's request because he was dangerous.

These two sentences have identical syntactic structures, differing only in the choice of the adjective in the second clause (*cautious* in the first sentence versus *dangerous* in the second). Yet most people feel that *he* refers to the judge in 40a but to the prisoner in 40b. Why should this be?

The crucial factor involves our beliefs about people in our society and their likely characteristics and behavior. All other things being equal, we are more likely to believe that a judge is cautious and a prisoner dangerous than vice versa. This in turn leads us to interpret the pronoun as referring to the judge in the first sentence in 40 but to the prisoner in the second.

Presupposition. There are many other ways in which a speaker's beliefs can be reflected in language use. Compare in this regard the following two sentences.

- 41) a. Have you stopped exercising regularly?
 b. Have you tried exercising regularly?

Use of the verb *stop* implies a belief on the part of the speaker that the listener has been exercising regularly. No such assumption is associated with the verb *try*.

The assumption or belief implied by the use of a particular word or structure is called

a **presupposition**. The following two sentences provide another example of this.

- 42) a. Nick admitted that the team had lost.
 b. Nick said that the team had lost.

Choice of the verb *admit* in 42a indicates that the speaker is presupposing the truth of the claim that the team lost. No such presupposition is associated with the choice of the verb *say* in 42b, where the speaker is simply reporting Nick's statement without taking a position on its accuracy.

Still another type of presupposition is illustrated in 43.

- 43) a. Abraham Lincoln was assassinated in 1865.
 b. Abraham Lincoln was murdered in 1865.

Notice that use of the verb *assassinate* in 43a involves the assumption that Abraham Lincoln was a prominent person, but that no such presupposition is associated with the verb *murder*.

4.2 Setting

As noted at the beginning of this section, the pragmatic factors relevant to sentence interpretation can include knowledge of the context in which a sentence is uttered, including its physical environment or **setting**.

All languages have forms whose use and interpretation depend on the location of the speaker and/or hearer within a particular setting. Called spatial **deictics**, these forms are exemplified in English by words such as *this* and *here* (proximity to the speaker) versus *that* and *there* (proximity to the hearer and/or distance from the speaker). Thus, if Steve and Brian are sitting across from each other at a table, each would refer to a plate directly in front of him as *this plate* and to a plate in front of the other or a plate distant from both as *that plate*. Without an understanding of how the setting in which a sentence is uttered can influence the choice of words such

Table 6.17 Languages with a Three-way Deictic Distinction

| Language | 'this' | 'that' | 'that over there' |
|----------|--------|---------|-------------------|
| Spanish | este | ese | aquel |
| Japanese | kono | sono | ano |
| Korean | i | ku | ce |
| Palauan | tia | tilecha | se |
| Turkish | bu | su | o |

as *this* and *that*, it would be impossible for speakers of English to use or interpret these forms correctly.

As the preceding examples show, English makes a two-way distinction in its expression of deictic contrasts. However, many languages have a three-way system that may be sensitive to distance from the speaker, the addressee, or both (depending on the language). (See Table 6.17.) An even more complex system is found in the Amerindian language Tlingit, which makes a four-way distinction: *yáa* 'this one right here', *héi* 'this one nearby', *wéé* 'that one over there', and *yóó* 'that one far off'.

Determiners are not the only type of element whose use and interpretation require reference to features of the setting. In English, for example, deictic contrasts are also crucial to the understanding of such commonly used verbs as *come* and *go*. Notice in this regard the striking difference in perspective found in the following two sentences.

- 44) a. The bear is coming into the tent!
 b. The bear is going into the tent!

Whereas *come* with a third person subject implies movement toward the speaker (hence we can infer that the person who utters 44a is in the tent), *go* with the same type of subject suggests movement away from the speaker.

4.3 Discourse

An additional source of contextual information relevant to sentence interpretation can be found in **discourse**, the connected series of utterances produced during a conversation, a lecture, a story, or some other speech act. The importance of discourse stems from the fact that individual sentences commonly include elements whose interpretation can only be determined with the help of information in preceding utterances. For instance, each of the italicized words in the following passage relies for its interpretation on information encoded in a preceding sentence.

- 45) A little girl went for a walk in the park. While *there*, *she* saw a rabbit. Since *it* was injured, *she* took *it* home.

We interpret *there* with reference to *in the park*, *she* with reference to *a little girl*, and *it* with reference to *a rabbit*.

One of the most important contrasts in the study of discourse involves the distinction between new and old information. **Old (or given) information** consists of the knowledge that the speaker assumes is available to the addressee at the time of the utterance, either because it is common knowledge or because it has been previously mentioned in the discourse. In contrast, **new information** involves knowledge that is introduced into the discourse for the first time. Consider the contrast between the following two sentences.

- 46) a. The man is at the front door.
 b. A man is at the front door.

The choice of *the* as the determiner for *man* in 46a suggests that the referent of the phrase is someone who has already been mentioned in the discourse and is therefore known to the addressee (old information). In contrast, the choice of the determiner *a* in

46b implies that the referent is being introduced into the discourse for the first time (new information).

Notice that both sentences in *46* use *the* as the determiner for *front door* and that the indefinite determiner *a* would not be natural in this context. This is because the setting for the conversation is likely to include only one front door. Since this information is likely to be known to both the speaker and the addressee (i.e., it is old information), *the* is the right determiner to use in this context.

Topics. Another important notion for the study of discourse is that of **topic**, which corresponds to what a sentence or a portion of the discourse is about. Consider the following passage.

- 47) Once upon a time there was a merchant with two sons. The older son wanted to be a scholar. He spent his time reading and studying. As for the younger son, he preferred to travel and see the world.

The first sentence in this passage introduces a merchant and his two sons as new information. A topic (the older son) is selected in the second sentence and maintained in the third, in which *he* refers back to the older son. The final sentence then switches to a new topic (the younger son), providing some information about him. This switch is facilitated by the expression *as for*, which can be used in English to mark new topics.

There is a strong tendency in language to encode the topic as subject of a sentence. This is why (as mentioned in Section 1.2) it is natural to interpret the active sentence in *48a* as being about the police and the passive sentence in *48b* as being about the burglar (see also Section 5.3 of Chapter 5 [Syntax]).

- 48) a. The police chased the burglar.
b. The burglar was chased by the police.

In some languages, a special affix is used to identify the topic. The following sen-

tences from Japanese illustrate this phenomenon (NOM = nominative, the subject marker; TOP = topic marker; QUES = question marker).

49)

Speaker A: Dare-ga kimasita-ka?
Who-NOM came-QUES?

Speaker B: John-ga kimasita.
John-NOM came.

Speaker A: John-wa dare-to kimasita-ka?
John-TOP who-with came-QUES?
'Who did John come with?'

The topic marker in Japanese (the suffix *-wa*) is distinguished from the subject marker (*-ga*) by its use to mark old or background information. This is why speaker B responds to A's first question by using the subject marker on the NP *John*. Because this NP provides new information (in answer to A's question), the topic marker would be inappropriate. However, once it has been established that John is the person who came, the corresponding NP can then bear the topic marker. This is precisely what happens in speaker A's final utterance, in which the NP *John* (now associated with previously established information) is marked by the topic suffix *-wa*.

4.4 Conversational Maxims

In addition to background beliefs, the setting, and the discourse, there is at least one other major type of information that enters into the interpretation of utterances. This information has to do with the "rules" for conversation—our understanding of how language is used in particular situations to convey a message. For example, if I ask you, *Would you like to go to a movie tonight?* and you respond by saying *I have to study for an exam*, I know that you are declining my invitation even though there is nothing in the literal meaning of the sentence that says so. Moreover, I recognize that this is a perfectly

appropriate way to respond. (Notice that the same could not be said of a response like *I have to scratch my arm* or *It's a bit warm in here.*)

As speakers of a language, we are able to draw inferences about what is meant but not actually said. Information that is conveyed in this way is called **conversational implicature**. The ease with which we recognize and interpret implicature stems from our knowledge of how people in our linguistic community use language to communicate with each other.

The general overarching guideline for conversational interactions is often called the **Cooperative Principle**.

50) *The Cooperative Principle*

Make your contribution appropriate to the conversation.

More specific **conversational maxims** or guidelines ensure that conversational interactions actually satisfy the Cooperative Principle as shown in Table 6.18. These maxims are responsible for regulating normal conversation but, as we will see, each can be suspended under certain circumstances to create particular effects.

Relevance. The Maxim of Relevance gives listeners a bottom line for inferring the intent of other speakers. For example, it is because of this maxim that we are able to

interpret the utterance *I have to study for an exam* (in response to the question *Would you like to go to a movie?*) as a no.

Failure to respect the Maxim of Relevance creates a peculiar effect. For example, if someone asks you *Have you finished that term paper yet?* and you respond *It's been raining a lot lately, hasn't it?* you violate the Maxim of Relevance by not responding in a relevant way. But by giving this response, you signal that you want to change the topic of conversation.

Quality. The Maxim of Quality requires that the statements used in conversations have some factual basis. If, for example, I ask *What's the weather like?* and someone responds *It's snowing*, I will normally assume that this statement provides reliable information about the current weather.

In order to achieve irony or sarcasm, however, it is sometimes possible to abandon the Maxim of Quality and say something that one knows to be false. Thus, if two people live in the middle of a sweltering desert and one person insists on asking every morning, *What's the weather like?* it might be appropriate for the other person to respond sarcastically, *Oh, today it's snowing, as usual*, perhaps with a particular facial expression or intonation to indicate that the statement was not intended as a true report of the facts.

Table 6.18 Some Conversational Maxims

The Maxim of Relevance

Be relevant.

The Maxim of Quality

Try to make your contribution one that is true. (Do not say things that are false or for which you lack adequate evidence.)

The Maxim of Quantity

Do not make your contribution more or less informative than required.

The Maxim of Manner

Avoid ambiguity and obscurity; be brief and orderly.

Considerations of politeness can also justify suspension of the Maxim of Quality. For instance, in order to avoid hurt feelings, you might congratulate a fellow student on a presentation, even though you thought it was the worst thing you ever heard.

Quantity. The Maxim of Quantity introduces some very subtle guidelines into a conversation. Imagine, for example, that someone asks me where a famous American author lives. The nature of my response will depend in large part on how much information I believe to be appropriate for that point in the conversation. If I know that the other person is simply curious about which part of the country the author lives in, it might suffice to respond, *in Mississippi*. On the other hand, if I know that the person wants to visit the author, then much more specific information (perhaps even an address) is appropriate.

The Maxim of Quantity can be suspended in order to mislead a conversational partner. For example, if someone asks me where Mary is and I know that Mary does not want any visitors, I might respond by saying, *I think she went downtown or something*, even though I know precisely where she is. In responding in this way, I am not being untruthful since I have said nothing false, but by giving less information than is appropriate, I am violating the Maxim of Quantity and hence being misleading.

Manner. The Maxim of Manner imposes several constraints on language use, two of which will be exemplified here. First, imagine that I refer to a particular person as *the man who Mary lives with*. A listener would be justified in concluding that the man in question is not Mary's husband. This is because, by the Maxim of Manner, a briefer and less obscure description,

Mary's husband, would have been used if it could have correctly described Mary's companion.

Second, imagine that an employer asks me about a former student of mine who has applied for a job and I say, with some sarcasm, *You will be fortunate indeed if you can get him to work for you*. By using a sentence that can be interpreted in two very different ways (*You will be glad to have him on your staff* versus *It is not easy to get him to do any work*), I violate the Maxim of Manner by using an ambiguous structure. Since the maxims are violated only for specific purposes, the employer would be justified in doubting the sincerity of my recommendation.

Summing Up. The study of semantics is concerned with a broad range of phenomena, including the nature of meaning, the role of syntactic structure in the interpretation of sentences, and the effect of pragmatics on the understanding of utterances. Although much remains to be done in each of these areas, work in recent years has at least begun to identify the type of relations, mechanisms, and principles involved in the understanding of language. These include the notions of extension and intension in the case of word meaning, thematic roles in the case of NPs, and c-command in the case of pronouns. Other factors known to be involved in an utterance's interpretation include constructional meaning, the speaker's and hearer's background beliefs (as manifested, for example, in presuppositions), the context provided by the setting and the discourse, and the maxims associated with the Cooperative Principle.

For more information on the sources used in this chapter, go to bedfordstmartins.com/linguistics/semantics and click on Sources.

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File 10.1: Introduction to Language Variation

Most people are aware of the fact that systematic differences exist among languages—for example, that English is different from Spanish, which is different from Arabic, which is different from Russian, and so on. However, many people are probably not aware of the extent to which systematic differences exist *within* languages. **Internal variation** refers to the property of languages of having different ways of expressing the same meaning. This is a property that is inherent to all human languages and to all speakers of a language. Thus, no two speakers of a language speak exactly the same way; nor does any individual speaker speak the same way all the time. The purpose of this unit is to introduce to you the ways in which languages vary internally and the factors that contribute to language variation. For purposes of familiarity, these files will focus primarily on variation in English, but you should keep in mind that variation exists in all languages.

10.1.1 VARIETIES, DIALECTS, AND IDIOLECTS

The term **language variety** is used among linguists as a cover term to refer to many different types of language variation. The term may be used in reference to a distinct language such as French or Italian, or in reference to a particular form of a language spoken by a specific group of people such as

Appalachian English, or even in reference to the speech of a single person. In addition to this cover term, there are more specific terms that are used to talk about these different types of language varieties.

When a group of speakers of a particular language differs noticeably in its speech from another group we say that they are speaking different **dialects**. In English, the term *dialect* often carries negative connotations associated with nonstandard varieties. However, a dialect is any variety of a language spoken by a group of people that is characterized by systematic differences from other varieties of the same language in terms of structural or lexical features. In this sense, every person speaks a dialect of his or her native language. The term *dialect* is also misused by laypeople to refer strictly to differences in pronunciation or sometimes to refer to slang usage (for more on slang see File 10.8). Such mistakes are easy to understand since differences in pronunciation are usually accompanied by variation in other areas of the grammar as well and thus correspond to dialectal differences. However, the appropriate term for systematic phonological variation is **accent**. In layperson's terminology, *accent* is often used in reference to "foreign accents" or regionally defined accents such as southern or northern accents. However, here again it must be noted that every person speaks with an accent. At the same

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time, **slang** has to do more with stylistic choices in vocabulary rather than systematic lexical differences between dialects. Also, as mentioned above, there is variation from speaker to speaker within any given language. The form of a language spoken by one person is known as an **idiolect**.

While these terms may seem simple and convenient here, when we consider actual languages, it becomes immediately obvious how difficult it is to make certain distinctions. How do we know, for example, if two or more language varieties are different dialects of the same language or if in fact they are separate, distinct languages? One criterion used to distinguish dialects from languages is **mutual intelligibility**. If speakers of one language variety can understand speakers of another language variety and vice versa, we say that these varieties are mutually intelligible. Suppose you are a native of Brooklyn, New York, and you go to visit some friends in Beaumont, Texas. You may notice some differences in the speech of your Beaumont friends (and they in yours), but essentially you will be able to understand each other. Your variety of speech and theirs are mutually intelligible but differ systematically, and are therefore dialects of the same language.

It is not always this easy, however, to decide whether two language varieties are different dialects of the same language or different languages just on the basis of mutual intelligibility. Other factors, such as cultural or historical considerations, may cloud the issue. In China, for example, Mandarin is spoken in the northern provinces and Cantonese in the southern province of Guangdong. Even though in spoken form these language varieties are not mutually intelligible, they are considered by the speakers of these varieties themselves to be dialects of the same language. Why? One reason is that these two varieties share a common writing

system and are thus mutually intelligible in written form.

The opposite situation exists in the American Southwest between Papago and Pima, two Native American languages. These two language varieties are indeed mutually intelligible, having less linguistic difference between them than exists between Standard American English and Standard British English. However, because these two tribes regard themselves as politically and culturally distinct, they consider their respective languages to be distinct as well. Similarly, Serbocroatian has now split because of politics into at least three distinct, yet mutually intelligible, languages in the Balkans: Croatian, Serbian, and Bosnian.

Another complication for the criterion of mutual intelligibility is found in a phenomenon known as a **dialect continuum**. This is a situation where, in a large number of contiguous dialects, each dialect is closely related to the next, but the dialects at either end of the continuum (scale) are mutually unintelligible. Thus, dialect A is intelligible to dialect B, which is intelligible to dialect C, which is intelligible to dialect D; but D and A are not mutually intelligible. A situation such as this is found near the border between Holland and Germany, where the dialects on either side of the national border are mutually intelligible. Because of international boundaries, however (and probably political and cultural considerations as well), speakers of these varieties regard them as distinct languages.

At what point is the line drawn? Clearly, the criterion of mutual intelligibility does not account for all the facts. Indeed, there may be no clear-cut, black-and-white answer to such a question in every case. In File 12.9, related languages are discussed in terms of what is known as the Family Tree Model. According to this model, a parent language may split and form daughter languages—

e.g., Germanic split off into English, Dutch, and German (among others). This type of split may also occur when dialect differences become so great that the dialects are no longer mutually intelligible to the speakers of these language varieties.

10.1.2 SPEECH COMMUNITIES

A group of people speaking the same dialect is known as a **speech community**. Speech communities may be defined in terms of a number of **extralinguistic factors** (*extra-* in the sense of ‘outside of’, that is, factors not based in linguistic structure), including region, socioeconomic status, and ethnicity. However, it is rarely, if ever, the case that there exists a speech community in which a “pure” dialect—i.e., purely regional, purely ethnic, etc.—is spoken, because the identification of any speech variety as a pure dialect requires the assumption of **communicative isolation**. Communicative isolation results when a group of speakers forms a coherent speech community relatively isolated from speakers outside of that community. This type of isolation was perhaps once a possibility but is becoming increasingly rare these days owing to social and geographic mobility, mass media, etc. What is more likely the case today is that a particular dialect of a speech community is influenced by regional, social, and cultural factors. Thus, in most instances the varieties spoken among members of a speech community are not pure dialects but instead are influenced by the interaction of many different factors. Consider, for example, the following utterances:

- (a) I used to could dance.
- (b) I ain't no girl now.
- (c) He had a broken back _____ was never set.
- (d) Put some bakin' sody on it.
- (e) I fell upside of the building.

Note the underlined parts of each sentence:

- (a) a double modal,
- (b) multiple negation,
- (c) relative pronoun deletion,
- (d) substitution of [i] for [ə] in *soda* [sodə], and
- (e) lexical substitution of *upside of* for *up against the side of*.

All of these features have been identified as characteristic of Appalachian English (AE), a variety that, from its name, appears to be regional. However, to label this variety of English as regional tells only part of the story. The speaker of these utterances was a sixty-eight-year-old male, belonging to a lower socioeconomic status group. He was a native of a southeastern Ohio county that borders several Appalachian counties and that experienced a post-World War II influx of Appalachian blue-collar workers. Clearly, where this person lives has something to do with his variety of speech. But there are other relevant factors as well. For example, it has been determined that the pronunciation of *soda* in (d) represents a dying feature of AE and seems to be limited to older speakers. This feature, then, is not only geographically related but seems age related as well. Moreover, studies indicate that in careful speech men tend to use more nonstandard forms than women. So the fact that this speaker is male may also be relevant to his dialect. Finally, AE is a dialect spoken primarily by low-income, rural speakers, a group to which our southeastern Ohio speaker belongs.

So while it is true that AE is a dialect generally restricted to that area designated as Appalachian by the Appalachian Regional Commission, it can also be seen that geographic region overlaps with at least three other factors—age, gender, and socioeconomic status. This sort of interaction among extralinguistic factors seems to be true of most, if not all, speech communities and their corresponding dialects.

10.1.3 OVERVIEW OF CHAPTER

File 10.2 provides some examples of linguistic variation at five different levels of linguistic structure. In File 10.3 we take a look at how class, education and income can influence language variation. File 10.4 presents a picture of the various regional dialects spoken in the U.S. as well as some of the principles used in their classification. In File 10.5 we take a look at the most famous ethnic dialect spoken in the U.S., that of African-American English. File 10.6 discusses the

issue of attempts to make English the official language of the U.S. and its consequences. File 10.7 introduces language variation based on gender differences and 10.8 explores the stylistic dimensions of language variation. In 10.9 we take a closer look at two famous case studies of language variation research by sociolinguist William Labov, one on the island of Martha's Vineyard and one in New York City. Finally, 10.10 provides some useful exercises that exemplify many of the different kinds of language variation introduced in this chapter.

File 10.2: Variation at Different Levels of Linguistic Structure

While we are probably most consciously aware of differences in vocabulary choice or pronunciation, internal variation exists at all levels of linguistic structure. The examples below illustrate different types of variation in English at each level of linguistic structure.

10.2.1 PHONETIC LEVEL

1. In most American dialects, the sounds [t, d, n, s, z] are produced with alveolar articulation, but some New York City dialects have dental articulation whereby the tongue tip touches the top teeth.
2. Some British and Scottish dialects of English produce a trilled *r*, [r̡], while most American dialects have either a retroflex [ɻ] or a “bunched” [ɹ].

10.2.2 PHONOLOGICAL LEVEL

1. Most American dialects have one vowel, [ɔ], in *caught*, *dawn*, and *hawk*, and another, [a], in *cot*, *Don*, and *hock*. However, some dialects have the same vowel in all of these words (usually a vowel closer to [a] than to [ɔ]), so that in these particular dialects *Don* and *dawn* are homophonous.
2. In southern England, words like *flood*, *but*, *cup* have the vowel [ʌ] and words like *full*, *good*, *put* have the vowel [ʊ]. In northern English dialects, however, both sets of words have the vowel [ʊ].
3. Standard British English does not permit sequences of V–r–C or V–r–#. This is similar

to Bostonian English, where the sentence *Park the car* is pronounced [pak ðə ka].

4. Some African-American English dialects do not permit sequences of C–r or C–l, especially in unstressed syllables, so that the word *professor* would be pronounced [pəfəsə].

10.2.3 MORPHOLOGICAL LEVEL

1. Some rural British English dialects use the possessive morpheme with pronouns but not with nouns, e.g., *my life*, *his dog* but *Tom car*, *the old lady purse*.
2. In parts of northern England and southern Wales -s is not just a third singular present tense marker, but a general present tense marker. These speakers say sentences like *I likes him*, *We goes*, etc.
3. Many dialects of English have *hisself* and *theirselves* where Standard English has *himself* and *themselves*.
4. Appalachian English has past tense forms for various verbs that are different from the past tense forms found in other American dialects, e.g., Appalachian English has [klʌm], [ɛt], and [hɛt] where other dialects have *climbed*, *ate*, and *heated*, respectively.

10.2.4 SYNTACTIC LEVEL

1. For many southern speakers of American English, *done* can function as an auxiliary, as in *She done already told you* rather than *She has already told you*.

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2. For many Appalachian speakers *right* can function adverbially, e.g., *a right good meal*.
3. In some dialects combinations of auxiliaries like *might could*, *might would*, *may can*, and *useta could* are permitted and form a single constituent.
4. Many midwestern dialects have the construction *The crops need watered* as a variant of *The crops need to be watered*.

10.2.5 SEMANTIC LEVEL (VOCABULARY CHOICE)

1. *Knock up* means ‘rouse from sleep by knocking’ in British English but ‘make pregnant’ in American English.
2. Words for carbonated beverages differ from place to place. *Soft drink*, *soda*, *pop*, *soda pop* are all different ways of expressing the same meaning.

File 10.3: Language and Socioeconomic Status

10.3.1 STANDARD VS. NONSTANDARD VARIETIES

The popular notion persists that every language consists of one “correct” dialect from which all other “inferior” or “substandard” dialects diverge. This misconception has arisen from social stereotypes and biases. It is not a linguistic fact. It is important to realize that a person’s use of any particular dialect is not a reflection of his or her intelligence or judgment. *Linguistically speaking, no one dialect or language is better, more correct, or more logical than any other.* Rather, every language variety is a rule-governed system and an effective means of communication. The aim of this file is to provide you with an understanding of how the terms **standard dialect** and **nonstandard dialect** are defined linguistically, and to dispel some of the myths associated with these terms.

10.3.2 STANDARD DIALECTS

The notion of standard dialect is really a complex one and in many ways an idealization. Descriptively speaking, the standard dialect is the variety used by political leaders, the media, and speakers from higher socioeconomic classes. It is also the variety taught in schools and to nonnative speakers in lan-

guage classes. Every language has at least one standard dialect, which serves as the primary means of communication across dialects.

In actuality, there is no one standard dialect but instead many different varieties of what people consider to be the standard. What ties these different notions together is **prestige**. Socially speaking, the standard dialect is the dialect of prestige and power. However, the prestige of any speech variety is wholly dependent upon the prestige of the speakers who use it. In the United States, the prestige group usually corresponds to those in society who enjoy positions of power, wealth, and education. It is the speech of this group, therefore, that becomes the standard, but there is nothing about the variety itself that makes it prestigious.

For proof of this claim, consider a case in which the status of a particular linguistic feature has changed over time from standard to nonstandard. Recall from the discussion of *prescriptive* vs. *descriptive* rules of grammar (section 1.3.3 in File 1.3) that multiple negatives were once commonly used by speakers of standard Old English and Middle English. Take, for example, this multiple-negative construction from Geoffrey Chaucer’s description of the Knight in the General Prologue to the *Canterbury Tales* (from Millward 1989:158):

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He never yet no vileyneye ne sayde

He never yet no villainy not said

In al his lyf unto no maner wight

In all his life to no kind of creature

Today, however, speakers who most commonly employ multiple-negative constructions are not members of the higher socio-economic (i.e., prestige) group. Such constructions are rarely used in public spheres by political leaders or media spokespeople, and English grammar instructors discourage use of these forms in writing or in speech. Thus multiple negation is today considered a nonstandard feature. This example illustrates a change over time in the **prescriptive standard**, the standard by which we make judgments of “right” and “wrong.” This example proves that such judgments are not linguistically founded but are instead governed by societal opinion, and most often by societal evaluation of speakers.

To consider another example of how linguistically arbitrary notions of the standard are, let us look at the following case. Few standard English speakers use object pronouns in subject position, as in (1) below:

- (1) Kim and me went to the store.

Yet media spokespeople, political leaders, and others of higher socioeconomic status are more and more frequently observed using subject pronouns in object position as in (2) and (3):

- (2) This is a matter between Kim and I.
- (3) Give the books to Kim and I.

According to the prescriptive standard, sentences (1), (2), and (3) should all be “corrected” as follows:

- (4) Kim and I went to the mall.
- (5) This is a matter between Kim and me.
- (6) Give the money to Kim and me.

However, not only would many standard English speakers not recognize (2) and (3) as violations of prescriptive rule; many would argue that intuitively sentences (2) and (3) seem “correct” while (5) and (6) seem “incorrect.” This is known as **hyper-correction**, the act of producing nonstandard forms by way of false analogy. This example shows us that even violations of prescriptive rule (such as sentences 2 and 3 above) can be perceived as standard if they are used by members of the prestige group.

a. Standard American English (SAE)

The standard dialect in the United States is called **Standard American English (SAE)**. As with any standard dialect, SAE is not a well-defined variety but rather an idealization, which even now defies definition because agreement on what exactly constitutes this variety is lacking. SAE is not a single, unitary, homogeneous dialect but instead comprises a number of varieties. When we speak of SAE, we usually have in mind features of grammar more than pronunciation. In the United States, where class consciousness is minimal, pronunciation is not terribly important. Thus, there are varieties of SAE that are spoken with northern accents, southern accents, coastal New England accents, etc., but that are still considered standard. This is not to say that we do not make evaluations of speech based on accent, because we do. But we seem to be far more “tolerant” of variation in accent than we are of grammatical variation. Compare, for example, the varieties of English spoken by Connecticut native George Bush, Arkansan Bill Clinton, and Texan Ross Perot in the 1992 presidential debates. Most would agree that all three are speakers of SAE. And yet they all speak with distinctly different accents.

In Britain, on the other hand, where class divisions are more clearly defined and social mobility is more restricted, standard pronunciation or Received Pronunciation (RP), also known as BBC English or the “Queen’s English,” takes on the importance of standard grammar and vocabulary. Thus in Britain both pronunciation and grammar are markers of social status.

10.3.3 NONSTANDARD DIALECTS

All dialects that are not perceived as varieties of the standard are called nonstandard. It is important to understand that nonstandard does not mean “substandard” or “inferior,” although this is the perception held by many. Just as standard dialects are associated with the language of the “powerful” and “prestigious,” nonstandard dialects are usually associated with the language of the lower socioeconomic classes.

Most nonstandard varieties are stigmatized in the wider community as illogical and unsystematic. It is on this basis that many justify labeling nonstandard varieties as “bad” or “improper” ways of speaking, as opposed to standard varieties, which are said to be “good” or “proper.” Again, it must be emphasized that such evaluations are linguistically unfounded. Consider the following paradigms illustrating the use of reflexive pronouns in two varieties of English—one standard, the other nonstandard.

| <i>Standard</i> | <i>Nonstandard</i> |
|----------------------|-----------------------|
| I like myself | I like myself |
| You like yourself | You like yourself |
| He likes himself | He likes hisself |
| She likes herself | She likes herself |
| We like ourselves | We like ourselves |
| You like yourselves | You like yourselves |
| They like themselves | They like theirselves |

Given these two paradigms, we can develop descriptive rules for the construction of reflexives in these two varieties.

- | | |
|--------------|---|
| Standard: | Add the reflexive suffix <i>-self</i> to possessive pronouns in the 1st and 2nd person singular and <i>-selves</i> to possessive pronouns in the 1st and 2nd person plural. |
| | Add the reflexive suffix <i>-self</i> to object pronouns in the 3rd person singular and <i>-selves</i> to object pronouns in the 3rd person plural. |
| Nonstandard: | Add the reflexive suffix <i>-self</i> to possessive pronouns in the 1st–3rd person singular and <i>-selves</i> to possessive pronouns in the 1st–3rd person plural. |

Given these rules, what about the nonstandard variety makes it any less systematic or less logical than the standard variety? Nothing. Both varieties are systematic and both are logically constructed. In fact, some may argue that the nonstandard variety is more systematic than the standard variety because it uses the same form of each pronoun, the possessive, as the stem for forming the reflexive paradigm. This system, consequently, would be much easier to teach to nonnative speakers of English or children learning a first language than the standard system which must stipulate two separate conditions.

a. Overt vs. Covert Prestige and Acts of Identity

Often, speakers who do not adapt to the standard are considered “lazy,” “uneducated,” and “unambitious.” Speakers of nonstandard varieties are told that the varieties they speak are “wrong” and “inferior” and that they must learn to speak the varieties taught in school in order to become successful. As a result, children who come from homes where nonstandard varieties are spoken are at an immediate disadvantage in school, where they are forced to make adjustments from the language of their home communities to the standard

varieties of the schools (an adjustment unnecessary for children from homes where standard varieties are spoken). Some make these adjustments and become **bidialectal** speakers, having a mastery of two dialects—one a standard variety, the other a nonstandard variety. Others become only marginally fluent in the standard but gain a mastery of the nonstandard dialect. And yet others master the standard and reject the nonstandard dialect altogether.

Which adjustments are made depends on a number of different factors. One factor returns us to the notion of *prestige*, specifically to the distinction between **overt prestige** and **covert prestige**. Overt prestige is the type of prestige discussed in section 10.3.2 above entitled “Standard Dialects.” This is the prestige that is attached to a particular variety by the community at large, which defines how people should speak in order to gain status in the wider community. But there is another type of prestige that exists among members of nonstandard speaking communities and defines how people should speak in order to be considered members of those particular communities. The desire to “belong” to a particular group often becomes the overriding factor. Thus, in many ways nonstandard varieties persist, despite their stigmatized status, because of covert prestige. In this sense, language becomes a marker of group identification.

Another way of looking at this is in terms of what researchers R. B. Le Page and Andrée Tabouret-Keller refer to as “acts of identity.” These two researchers have investigated the relationship between language and social identity, working from the following hypothesis:

The individual creates for himself the patterns of his linguistic behaviour so as to resemble those of the group or groups with which from time to time he wishes to be identified, or so as to be unlike those from

whom he wishes to be distinguished. (p. 181)

Their theory is that we choose to speak the way we do based on how we identify ourselves and how we want to be identified. The extent to which we are able to make certain linguistic choices as acts of identity is dependent upon the following conditions being met (p. 182):

1. We can identify the groups.
2. We have both adequate access to the groups and ability to analyze their behavioral patterns.
3. The motivation to join the groups is sufficiently powerful, and is either reinforced or reversed by feedback from the groups.
4. We have the ability to modify our behavior.

Thus to the extent that we are able to make certain linguistic choices, social identity plays a major role. Teenagers who wish to distinguish themselves from adults, members of rural communities who wish to be distinguished from members of urban communities, members of certain ethnic groups who wish to be identified as distinct from other ethnic groups, etc., may do so through language.

In this sense, language is more than just a means of communication; it is a type of “social badge.” Of course, how we speak is not totally up to us; linguistic exposure is also a major factor, as discussed in the files on language acquisition. However, what this shows is that variation does not degrade a language or make it in some way imperfect. It is a natural part of every language to have different ways of expressing the same meanings. And linguistically speaking, the relationship between standard and nonstandard varieties is not one of good vs. bad, right vs. wrong. They are simply different ways of speaking, defined and determined by social structure and function.

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Analyzing Variation in Sign Languages: Theoretical and Methodological Issues

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Sociolinguistic inquiry examines the complex relationship between language and its social context. Language is much more than a means of communication; it is also a social object that both reflects and helps constitute the social context in which it is embedded. One of the ways that language accomplishes this social function is through the variable use of linguistic forms. If a language provides speakers with more than one way to say the same thing, speakers will use the variants to mark group identity, group solidarity, and social distance and also to define the social environment (Fasold 1984). Sociolinguistic theory holds that the understanding of such variation is crucial to an understanding of language itself. Unlike traditional linguistic inquiry, which might ignore or attempt to minimize the importance of linguistic variation, sociolinguistic research makes variation the primary object of inquiry, explains the variable use of a linguistic form based upon sociolinguistic factors, and reveals linguistic forms that may be in the process of change.

Sociolinguistic inquiry is especially suited to describing the differences between language varieties. By delineating the linguistic differences between two language varieties and then correlating each with the linguistic and social contexts in which they occur, the patterning of the nonstandard variety emerges. In fact, demonstrating that vernacular dialects consist of linguistic pat-

terns just as systematic as the patterns that characterize standard varieties is one of the great contributions of sociolinguistic research (Wolfram 1993). Finally, sociolinguistic analysis of how an individual signer utilizes a particular variable can reveal the unconscious but highly complex patterning and functioning of a variable within the lect of an individual.

LINGUISTIC VARIATION

Among its other attributes, language is a social object that both reflects and helps to constitute the social structure in which it is embedded. The complex relationships among language, social structure, and the context of use compose the object of sociolinguistic inquiry. Although sociolinguists have employed a number of approaches to the study of the relationship between linguistic form and social structure, including the ethnography of speaking (e.g., Bauman and Sherzer 1974), interactional sociolinguistics (e.g., Gumperz 1982), and discourse analysis (e.g., Tannen 1984), the variationist paradigm developed by William Labov has proven to be one of the more productive.

The relationship between language and social context is most apparent in the variable use of a particular linguistic form, be it phonological, morphological, lexical, or syntactic. Since Labov's study in 1966 of variable deletion of [r] by residents of the

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Lower East Side of New York City, sociolinguistic research has repeatedly confirmed that nonlinguistic facets of an interaction strongly influence the particular linguistic form a speaker will use at any given moment in the interaction. These include the personal, social, sociocultural, and socioeconomic characteristics of the participants, as well as the characteristics of the interaction itself (e.g., formal vs. informal). In other words, factors outside the language influence which particular linguistic forms a speaker will use. The socioeconomic factors that influence how often a variable will occur are referred to as social constraints. There may also be linguistic factors that influence how often a variable will occur, which are referred to as linguistic constraints.¹ Typically, the frequency at which a particular variant occurs is influenced by both types of constraints. For example, in his study of the phonological variable pinky extension, Hoopes (1998) found that the occurrence of pinky extension was strongly influenced by three linguistic constraints—the phonological structure of the sign, the syntactic category of the sign, and the prosodic function of the sign. But its occurrence was also influenced somewhat by the degree of social distance between the subject and her interlocutor in the interaction (i.e., a social constraint). The closer the relationship, the more likely pinky extension was to occur. Thus, the frequency of pinky extension was influenced by the linguistic and the social constraints working in concert.

The influence of contextual factors on language use was originally postulated by Labov and others, on the basis of spoken language research. It is now beyond dispute that sociolinguistic phenomena also obtain in sign language. Careful studies over the past twenty years have shown correlations between sociolinguistic factors and linguistic

variables on every linguistic level. For example, Lucas and Valli (1992) demonstrated that signers code switch among varieties of ASL (along the ASL–Contact Sign–Signed English continuum) and that the particular language variety used during a given interaction is largely determined by sociolinguistic factors. Likewise, Woodward (1973, 1994) found that five morphological variables of ASL (e.g., verb reduplication and verb incorporation of negation) closely correlated with sociolinguistic factors.² For a thorough survey of this growing body of sociolinguistic research of sign languages, see Patrick and Metzger (1996).

DISCOVERING AND DESCRIBING VARIATION ACROSS INDIVIDUALS AND COMMUNITIES

Sociolinguistic variation in ASL has been noted since the beginning of research on the language. The *Dictionary of American Sign Language* (Stokoe, Casterline, and Croneberg 1965) reports variants for many signs, including LIE and MOTHER. Croneberg's (1965) discussion of variation in the dictionary suggests social dimensions that might be investigated for correlations with variation, including region and ethnicity. Several studies in the 1970s examined phonological variation in ASL, describing social and linguistic constraints on variation in handshape, location, and orientation of lexical signs (Battison et al. 1975; Woodward et al. 1976; Woodward and Erting 1975). These early studies of ASL variation share with studies of spoken language variation a commitment to describing patterns in a particular community's use of language, whether the community is large, as in the Deaf community of the United States, or smaller, defined in regional or social terms (Labov 1972; Milroy 1987; Lucas 1995; Rose et al. 1998). The three studies we report on here all had as their primary goal to describe

systematic variation in the use of ASL within and across individuals and groups within the U.S. Deaf community.

Since the earliest studies of variation in ASL, research on variation has changed in that new quantitative and qualitative tools have been developed (Milroy 1980, 1987; Rousseau and Sankoff 1978; Rand and Sankoff 1990). At the same time, our understanding of ASL phonology, morphology, syntax, and discourse structure has deepened. It is in this environment of recent social and linguistic research that the three studies presented here took up their respective topics. In brief, the three studies are as follows:

1. Hoopes (1998) examined constraints on pinky extension in lexical ASL signs.
2. Collins and Petronio (1998) set out to discover differences in the way that deaf-blind signers use ASL, as compared to sighted users of ASL.
3. Lucas, Bayley, Valli, in collaboration with Rose, Wulf, Dudis, Sanheim, and Schatz (forthcoming) studied sociolinguistic variation in ASL, relying primarily on quantitative methods to describe phonological and morphosyntactic variation in ASL as it is used around the country and across social groups. The analysis of one variable, the sign DEAF, is summarized here; this report is a follow-up study to Lucas's earlier investigation (1995).

Certain methodological issues are common to all variation studies, and we will show how these concerns relate to the choice of informants, to the elicitation of vernacular language, and to the variables and constraints, both social and linguistic, considered in all of the studies. Next, we will discuss concerns that may be particular to studying sociolinguistic variation in sign languages. These community-particular concerns color not only the methodologies employed, but also the social constraints considered in the analyses. Finally, we will

set out the methodologies of all three studies.

Defining and Sampling a Community

The first issue common to studies of variation in both signed and spoken languages concerns sampling. The goal of all variation studies is to describe the patterns of variable linguistic structure within and across language communities. Whether the study is qualitative or quantitative, participants in the study must be members of the communities whose language use is being described. Further, quantitative sociolinguistic work that seeks to reach conclusions about language use in a community as a whole must take steps to ensure that its participant group is as representative as possible of the entire community. A study of variable ASL use in the Deaf community, for example, must study the language use of deaf people who use ASL. The language community may be defined in both linguistic and social terms. If the study finds that a group of ASL users share some aspect of their language in common, (e.g., if the constraints on a particular variable affect all members of the community in the same way), then this is evidence that the group is a linguistic community (Labov 1972).

When defining the language community in social terms, variation studies have taken two main approaches. One approach is to use broad social categories like socio-economic status and gender to draw boundaries around subgroups within a community (Labov 1966, 1972). Another is to use community-based social networks. This latter approach looks at a community in terms of the number and nature of connections among individuals in order to correlate these connections with patterns of language use (Labov 1966, 1972; Milroy 1980, 1987; Eckert 1989a). A researcher who employs either

approach, however, has an explicit definition of the language community in terms of common social factors.

The three studies discussed here examined variation in language structure and use in the U.S. Deaf community (Padden and Humphries 1988; Padden 1997). The researchers in each case took steps to ensure that all participants were deaf users of ASL, and that they were all connected socially to their local Deaf communities. In the pinky extension (PE) study and in the Tactile ASL study, the participants were known to the researchers to be members of local Deaf communities. They had grown up as users of ASL, attended residential schools, and participated in social relationships with other deaf people and in Deaf organizations like Deaf clubs. For the Tactile ASL study, it was also important that participants be members of a community of deaf-blind people. Collins and Petronio defined this membership both in terms of physical blindness and in terms of language use and socialization. All fourteen participants in their study were legally blind as a result of Usher syndrome I; all of them regularly socialized with other deaf-blind adult users of Tactile ASL; and all were comfortable and experienced users of Tactile ASL. For the quantitative study of sociolinguistic variation in ASL, not all participants in the seven communities around the country were personally known to the researchers. Rather, the project relied on contact people in each area to recruit a sample that was as representative of the community as possible. This strategy was informed by the social network approach of Milroy (1987). Potential participants were approached by a contact person, a deaf individual who lived in the area, possessed a good knowledge of the local community, and was a respected member of the community. A major concern of this study was representativeness. Therefore,

the researchers and contact people tried to recruit a group of participants diverse enough to match the diversity of the U.S. Deaf community. The project sampled the language of 207 women and men in seven sites: Boston, Massachusetts; Frederick, Maryland; Staunton, Virginia; New Orleans, Louisiana; Olathe, Kansas; Kansas City, Missouri; Fremont, California; and Bellingham, Washington. African-American and white women and men were represented, as were working- and middle-class signers of both races. Participants ranged in age from 13 to 93, and included signers with deaf parents as well as those with hearing parents.

Describing Natural Language Use

The second issue in variation studies concerns the type of data analyzed. Studies of sociolinguistic variation differ in a fundamental way from formal studies of abstract linguistic competence: studies of variation are committed to studying language in context (Labov 1966, 1972; Milroy 1980, 1987; Lucas 1995). Directly eliciting different variants of a sociolinguistic variable would defeat the purpose of studying how the social and linguistic environments of language use condition variation. The sociolinguistic interview, though it has been used in many studies as a way in which linguists can record conversational language use, has been recognized as not being conducive to natural speech (Milroy 1987; Schilling-Estes 1999). The ideal would be to record and study the full range of the community's styles of language use, from formal lectures given to an audience of strangers to casual daily encounters with friends and acquaintances. In reality, this is impossible. First of all, few people, if any, whether they are deaf or hearing, hang out waiting for linguists to come and record their conversations. Also, as we

will discuss further below, the camcorder would get in the way.

Despite these fundamental limitations on linguists' access to natural language use, each of the three studies reported on here made methodological accommodations toward gathering conversations that were as natural as possible. The conversation types that were recorded differed on many dimensions: how well the conversational participants knew one another, the degree to which the conversations were about language itself, the length of the conversations, and the presence or absence of the researchers during the videotaping. Each of these dimensions might have provided an environment that would affect variation. For this reason, the conclusions take into account these aspects of the recorded conversations.

In the PE study, Hoopes recorded a signer during four different one- to two-hour conversations with other ASL users. The first and third conversations were with a close friend, also deaf, from the signer's residential school. The second recording was made during a conversation with a deaf graduate student from Gallaudet University, someone with whom the signer was casually acquainted. During these conversations, the deaf signer and her conversational partner were asked just to chat. The final conversation was with a hearing interpreter, a good friend of the signer. Before this conversation, the researcher suggested some topics they might discuss. During all of these conversations, the researcher was not a participant; in fact, he was absent from the room.

The Tactile ASL study relied on conversational data videotaped under two different circumstances. The first recording was made during an informal party that lasted about four hours. Eleven deaf-blind adults who regularly socialized together attended the party. The researchers video-

taped their Tactile ASL conversations with one another. In the second situation, three pairs of deaf-blind adults were recorded telling stories to one another using Tactile ASL. The researchers viewed this second set of data as coming from more formally situated language use.

Lucas et al.'s study of sociolinguistic variation in ASL videotaped groups of signers during one- to two-hour data collection sessions. These sessions were divided into three parts. The first consisted of approximately one hour of free conversation among the participants, without the researchers present. In the second part, at least two participants were selected from each group and interviewed in depth by deaf researchers about their educational and linguistic backgrounds, their social networks, and their patterns of language use. The final part involved eliciting lexical variants from the participants who had been interviewed. All participants in this part of the data collection were shown the same set of thirty-three pictures and were asked to supply signs for the objects or actions represented in the pictures.

Defining Variables and Constraints

The third issue that the studies described here share with all studies of sociolinguistic variation is a concern that what is being investigated is, in fact, a sociolinguistic variable. The three studies are among the first studies of variation in ASL in about twenty years. Our hope is that we know enough now about the structure of ASL to identify what varies, to describe it, and to quantify it. The first steps in variation analysis are to define the variable and the envelope of variation. That is, decide what forms count as instances of the variable and determine that the forms that vary indeed are two ways of saying the same thing.

The three studies required, first, a consideration of what features were noticeably variable. These variables might be found at any level of linguistic structure, from phonology to discourse. For the quantitative study of sociolinguistic variation in ASL, the hope was that these variables would also correlate with both linguistic and social factors. For the qualitative study of Tactile ASL, in which a language variety is being described in detail for the first time, the goal is that the variables that are described will uniquely identify the community being studied and will be amenable to further quantitative or applied work.

An additional issue that arises early in a variation study concerns specifying the factors that may potentially influence a signer's choice of a variant. Lucas (1995), for example, investigated the potential effects of eight separate linguistic factors on the choice of a variant of DEAF. As it turned out, most of these constraints proved not to be statistically significant. However, the labor of coding for many factors was not in vain. The study demonstrated that Liddell and Johnson's (1989) hypothesis that variation in the form of DEAF is influenced primarily by the location of the preceding sign is, at best, incomplete. The present studies are at different stages in the process of identifying constraints. The Tactile ASL study, because its purpose is simply to describe the differences between visual and Tactile ASL, set out to note features that were known to be unique to tactile signing. Collins and Petronio knew that being deaf-blind is a conditioning factor for some changes in language use, but the question was, what linguistic changes take place? The investigation of pinky extension and the sociolinguistic variation in ASL study, on the other hand, needed to propose constraints, both linguistic and social, on the variables to be quantified. A central theoretical issue for variation studies is the iden-

tification of internal constraints on the variables. As Labov stated, the issue "is to discover whatever constraints may exist on the form, direction, or structural character of linguistic change" (1994, 115). Phonological constraints on the variables considered by the PE and sociolinguistic variation studies could include the segmental phonological environment or suprasegmental, or prosodic, environment. Other linguistic constraints could be morphological, syntactic, or related to discourse topic or type of discourse. The linguistic constraints considered in each of these studies will be described in more detail below.

As for social constraints, the researcher's knowledge of the community should inform what factors are considered in the model of variation within the community. The PE study was not designed to take into account social constraints other than the level of intimacy between conversational partners, as it was expressly limited to investigating the variable signing of a single individual. The Tactile ASL study suggests that if deaf-blind and sighted individuals are included in the same study of variation in ASL, then this should be taken into account, as a deaf person's vision status could affect how he or she uses the language. Sociolinguistic variation in ASL study included several social factors in its statistical analysis of variants of DEAF.

SOCIOLINGUISTIC STUDIES IN THE DEAF COMMUNITY: SOME ISSUES

Social Constraints Particular to Deaf Communities

While social constraints like gender, age, and ethnicity might be common to all studies of sociolinguistic variation, many of these need to be articulated more fully when they are put into research practice in a particular community. This is particularly true for studies of linguistic variation in

Deaf communities. Notions like socioeconomic status or even age cannot be simply borrowed whole from studies of variation in spoken language communities.³ The differences in social constraints when applied to Deaf communities are of two types. First, there are constraints, like age, whose labels have a common application but which might have a different meaning considering the history of Deaf communities in this country. Second, there are constraints, like language background, that are unique to Deaf communities.

The first type of constraints include definitions of gender, age, regional background, and ethnicity, all of which need to be redefined when looking at Deaf communities. For deaf people, regional background, or where they grew up, may be less significant than where they attended school (especially if it was a residential school) or where their language models acquired ASL. Age as a sociolinguistic variable may have different effects on linguistic variation because of the differences in language policies in schools and classes for deaf children over this last century. Thus, while differences in the signing of older and younger people may appear to be due either to age-group differences or to natural language change such as occurs in all languages, these differences may also be the result of changes in educational policies, like the shift from oralism to Total Communication or from Total Communication to a bilingual/bicultural approach. These language policies affected not only what language was used in the classroom, but also teacher hiring practices (deaf teachers who used ASL or hearing teachers who knew no ASL). These language policies affected deaf children's access to appropriate language models, and this access may have varied across time to such an extent as to affect the kind of variation we see in ASL today.

With respect to ethnicity, demographics and oppression may work doubly against our understanding of language use in minority Deaf communities. The linguistic and social diversity in the Deaf community is just beginning to be explored by researchers (Lucas 1996; Parasniss 1997), and many questions remain about how African-American, Latin-American, or Asian-American deaf people self-identify and how they use language. Are the boundaries of these groups such that they form coherent groups whose ethnic identity is stronger than their Deaf identity? Or do the members of these groups construct a separate, minority Deaf identity? Is it reasonable to acknowledge multiple potential language influences? Is the use of a particular variant related to a person's identity as a Deaf person, or as an Anglo-American Deaf person, for example?⁴ Through the social network technique of contacting potential informants, the sociolinguistic variation in ASL study uncovered one way in which ethnicity and age have intersected to create a situation of oppression multiplied. The contact people were unable to find any Black Deaf people over age 55 who were members of the middle class (that is, who had a college education and were working in professional occupations). This finding suggests that political, social, and economic factors intersect with race and ethnicity in ways that have profound effects on minority language communities like the Deaf community.

With respect to gender, several questions emerge that are also related to the minority language community status of the Deaf community. Those yet to be answered include: Is there a solidarity in language use between men and women in a language minority group because of oppression from the outside and shared experiences rooted in being Deaf? Or are usage differences as pronounced as in other communities?

The second type of differences in social constraints arises from the unique characteristics of Deaf communities. The question of the language background of signers who participate in the studies is one such characteristic. Most participants in variation studies acquired the language under study, say English or Spanish, as a native language from native-speaking parents, as well as from exposure in their everyday environment. In Deaf communities, some participants had neither of these kinds of exposure to the language at the earliest stages of their development. Even deaf parents may not be native signers. It may seem that this problem conflicts with the goal of describing use of a particular language. However, if all signers who learned ASL from people other than their parents were excluded from sociolinguistic studies, such studies would be invalidated because they would not be representative of the community. Researchers should simply take account of the language background of their participants while drawing conclusions from the data. If the analysis is qualitative, the language background of the participants should be expressly stated in the report and taken into account in the analysis. If the analysis is quantitative, the influence of language background differences on the variables being investigated may be included as a factor in the statistical model.

A related constraint is the school background of informants. Whether the signers who participated in the variation study attended a residential or mainstream school may have influenced their signing. Some questions related to this issue are: Did the signers acquire ASL at a very early age from signing adults, or did they learn it at a later age, having entered the community later? At what age did they acquire or learn ASL? What kinds of signing—SEE, Contact Signing, or ASL—did their language models use?

Collecting Data: Videotaping and the Observer's Paradox

Linguists who conduct sociolinguistic research aspire to base their conclusions on conversation that is as natural as possible. However, one aspect of the basic method required for doing careful study of natural language use impinges on this goal: A conversation being studied must be recorded, yet the fact that the conversation is being recorded makes it less likely that it will be close to the vernacular use of the language. Labov (1966, 1972) has called this problem the "Observer's Paradox." When considering sociolinguistic research in Deaf communities, this problem may be magnified. Videotaping is more intrusive than audiotaping. Equally important is the issue of anonymity. While voices on an audiotape cannot be connected to a face or a name, except by the researchers, faces on a videotape are not anonymous. The Deaf community is small, and signers may be concerned, with good reason, that what they say on videotape will be seen by others in the community and understood out of context. With videotaping, anonymity is impossible.

What We Know and What We Can Study

The limits on what we know about sign language structure pose a further consideration for studies of variation in sign languages. We have learned much about the structure of ASL in the last twenty years, since the earliest studies of variation. For example, when the first studies of variation in ASL were conducted, the phonological specifications of signs were understood to be simultaneously produced. The variables considered in the present studies, on the other hand, assume that segments of signs occur in sequence, and that what varies phonologically are either individual features of these segments or the sequence in which these segments are

produced (Liddell and Johnson 1989; Lucas 1995). We need to know enough about the structure and meaning of the language to ensure that our variants have the same meaning and are simply two (or more) ways of saying the same thing. That is, we need to be able to distinguish between two forms that mean the same thing but are both part of the language and vary with respect to one another, and two forms that have different meanings and, therefore, cannot be said to be in variation. We also need to know enough about the phonological, morphological, syntactic, and discourse structures, and how they interact, in order to define carefully and clearly the environments that condition variation. In light of these concerns related to ASL structure, we are just beginning to understand what constitutes a variable in a sign language and what the possible linguistic constraints on variability are. Further, as the present studies begin to suggest, simply borrowing constraints from spoken language studies may not be sufficient to account for the variation we see in ASL (Lucas 1995).

In summary, the studies that we present here share some goals and methodological concerns with sociolinguistic research in general. They also represent three approaches to the question of variation in ASL, a question that requires attention to our understanding both of linguistic structure and of Deaf history, culture, and community.

METHODS EMPLOYED IN THE THREE STUDIES

In this section, we describe the methods used by the researchers in each of the three studies. Table 1 summarizes the goals and methodologies of these studies.

Pinky Extension: Confirming a Variable

The pinky extension (PE) study relies on data from a single individual's conversa-

tional signing to examine patterned variation in the pinky extension variable (Hoopes 1998). Sociolinguistic variables are not just variable over a community. The variation we see in ASL signing in Deaf communities does not result from one signer using one variant and one signer using another. Rather, a single speaker/signer ordinarily uses two or more variants of a single variable, even within the same conversation (Guy 1980). Signing with one's pinky extended on some signs has been anecdotally discussed as a possible phonological variable. Signs like THINK, WONDER, and TOLERATE (the latter two illustrated in Figure 1) can be signed either with the pinky (the fourth finger) closed or fully extended.

The study's goals were to determine whether pinky extension showed patterned variation that correlated with phonological, syntactic, or discourse constraints, and to consider functional explanations for these correlations. The study set out to (a) describe this potential variable as part of one individual's signing style and (b) discuss possible constraints on the individual's use of pinky extension.

The signer for the PE study was a 55-year-old Caucasian Deaf woman. She was deafened in infancy and was the only deaf member of her immediate family. She attended a residential school and Gallaudet College. She was videotaped in conversation over four separate sessions, each one to two hours long, for a total of seven hours of conversational data. Her conversational partners varied in how well she knew them (one was a long-time friend, another a recent acquaintance), and in whether they were hearing or deaf.

For the analysis, 100 occurrences of pinky extension were extracted from the videotaped data. Each of these occurrences was coded for the following linguistic and social factor groups:

Table 1. Summary of Goals and Methodologies of the Three Studies

| Goals and Methods | Study | | |
|------------------------|--|---|---|
| | Pinky Extension | Tactile ASL | Sociolinguistic Variation in ASL |
| Research questions | Is PE a sociolinguistic variable? What linguistic constraints possibly condition PE? | How does Tactile ASL differ from visual ASL in its phonology, morphology, syntax, and discourse structure? | What are the linguistic and social factors that condition use of three variants of DEAF? Which of these constraints are strongest? |
| Informants | 1 Deaf woman, an ASL user | 14 deaf-blind ASL and Tactile ASL users | 207 Deaf ASL users |
| Videotaping procedures | 4 conversations lasting 1 to 2 hours each | Conversations at a party lasting 4 hours (11 participants); Storytelling sessions (6 participants, paired) | Groups of 2 to 6 participants in three situations: Conversations in the group; Interview with the researcher; Responding to questions on lexical variants |
| Videotape analysis | Extracted 100 occurrences of PE. Compared timing of a subset of these occurrences with tokens of non-PE signs. | Developed specific questions about linguistic structure. Extracted examples of each type of structure from conversations. Generalized over examples to a statement about variant structure. | Watched videotapes for signers using DEAF. Glossed each occurrence of DEAF with information about constraints in a text database. |
| Methods of analysis | Coded each instance of PE for linguistic and social constraints. Compared percentages of PE and non-PE in different environments. Compared prosodic features. Suggested constraints that may condition PE. | Compared structures in Tactile ASL with parallel structures in visual ASL. | Coded each token for linguistic and social constraints. Entered coded tokens into VARBRUL. Used VARBRUL probabilities to find relevant and irrelevant constraints. Suggested variable linguistic rules that are part of the grammar of ASL. |

- Preceding handshape,
- Following handshape,
- Sign in which PE occurs,
- Discourse topic,
- Handshape of the PE sign,
- Syntactic category of the PE sign, and
- Level of intimacy between informant and conversational partner.

A subset of these occurrences was also coded for prosodic features. This coding

involved timing the duration of the tokens (occurrences) by the number of frames each lasted. These durations were averaged and compared with the duration of tokens of the same lexemes (signs) without pinky extension. The constraints investigated for this subset of tokens were the duration of the sign, whether there was a preceding or following pause, and repetition of the sign.

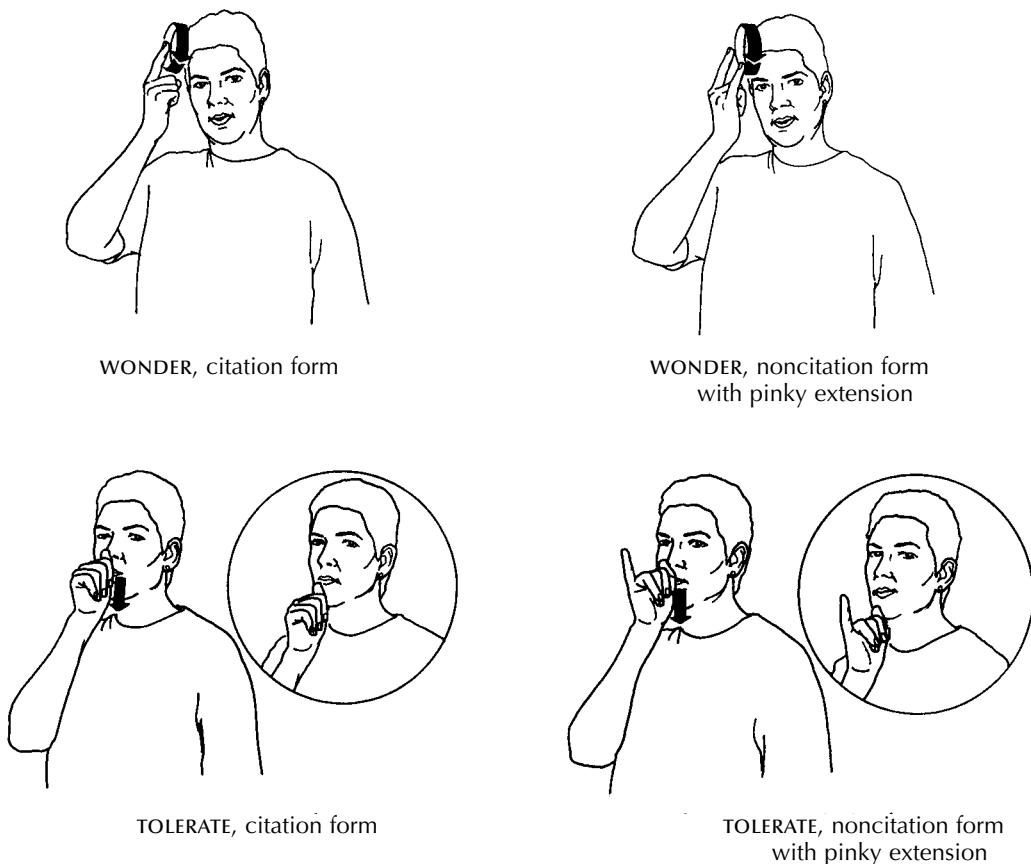


Figure 1. Citation and noncitation forms of WONDER and TOLERATE.

Some potential occurrences were excluded from the pool of tokens. Occurrences in fingerspelling were excluded because it was assumed that in these cases it resulted from processes other than those that could cause pinky extension in lexical signs. Also excluded were instances of lexicalized pinky extension, in which case the non-PE variant and the PE variant would not co-occur in the signing of one individual. Lastly, signs in which pinky extension did not occur over the full production of the sign were excluded.

The analysis of the full 100 tokens, not including the prosodic analysis, consisted of comparing percentages of tokens in each of the subgroupings of the constraints. In the

prosodic analysis, Hoopes compared the average duration of the signs with and without pinky extension.

Tactile ASL: Identifying Variables

While the ASL of sighted deaf people has been studied for forty years, the signing of deaf-blind people is a new subject of linguistic research. The Tactile ASL study set out to describe changes in signing that occur when ASL is used in a tactile, rather than a visual, mode. The goal was to describe the particular variety of ASL used in the deaf-blind community when deaf-blind people converse with each other. Collins and Petronio (1998) considered that varia-

tion between sighted ASL and Tactile ASL could occur at any level of linguistic structure.

To collect representative samples of deaf-blind conversation, Collins and Petronio used two sets of conversational data, one more informal, one more formal. Informal data were collected at a party attended by eleven deaf-blind people. The more formal data came from another set of conversations between three pairs of deaf-blind people, all using Tactile ASL to tell stories to each other. As mentioned earlier, the fourteen signers had all been born deaf, knew and used ASL prior to becoming legally blind, became blind as a result of Usher syndrome I, and regularly socialized with deaf-blind adults who use Tactile ASL. Tactile ASL can be received with one or both hands. In order to limit the possible variation that could occur even within Tactile ASL, only one-handed conversations were included in the data set used to describe the tactile variety of ASL.

Research questions specific to each level of linguistic structure were formulated. These questions are listed in Table 2. All of these questions focus on describing differences between visual and Tactile ASL. The

videotaped conversations were examined for evidence of structures or strategies that do not occur in visual ASL.

Sociolinguistic Variation in ASL: Providing Broad Quantitative Description

The goal of Lucas et al.'s study is to provide the basis for a description of phonological, morphosyntactic, and lexical variation in ASL. One of the variables, a set of three variants of the sign DEAF, is reported on here. The sign DEAF has many possible forms, but occurrences of only three of these forms were extracted from the videotapes. In citation form (+cf),⁵ the sign begins just below the ear and ends near the corner of the mouth. This form is called *ear-to-chin*. A second variant begins at the corner of the mouth and moves upward to the ear. This variant was labeled the *chin-to-ear* variant. The third variant considered here, the *contact-cheek* variant, consists of the index finger tapping the lower cheek without moving up. These variants (see Figure 2) were compared using statistical programs that require many tokens as input, but which allow the researcher to investigate the effects of many potential constraints at the same time. In this section, we will first discuss the benefits

Table 2. Questions Addressed by the Tactile ASL Study

| Level of Linguistic Structure | Questions |
|-------------------------------|--|
| Phonology | In Tactile ASL, the receiver's hand is placed on the signer's hand. Does this physical difference in the mode of communication result in changes in any of the sign parameters: handshape, movement, location and orientation? |
| Morphology | Deaf-blind people are unable to see the nonmanual adverbs and adjectives that accompany many lexical verbs and adjectives. How are these morphemes conveyed in Tactile ASL? |
| Syntax | Word-order in questions in visual ASL varies. What word orders occur in questions in Tactile ASL? |
| Discourse | The back-channel feedback given by addressees in visual ASL is inaccessible to deaf-blind people. What type of back-channeling in Tactile ASL replaces the head nods, head tilts, and facial expressions of back-channeling in visual ASL? |

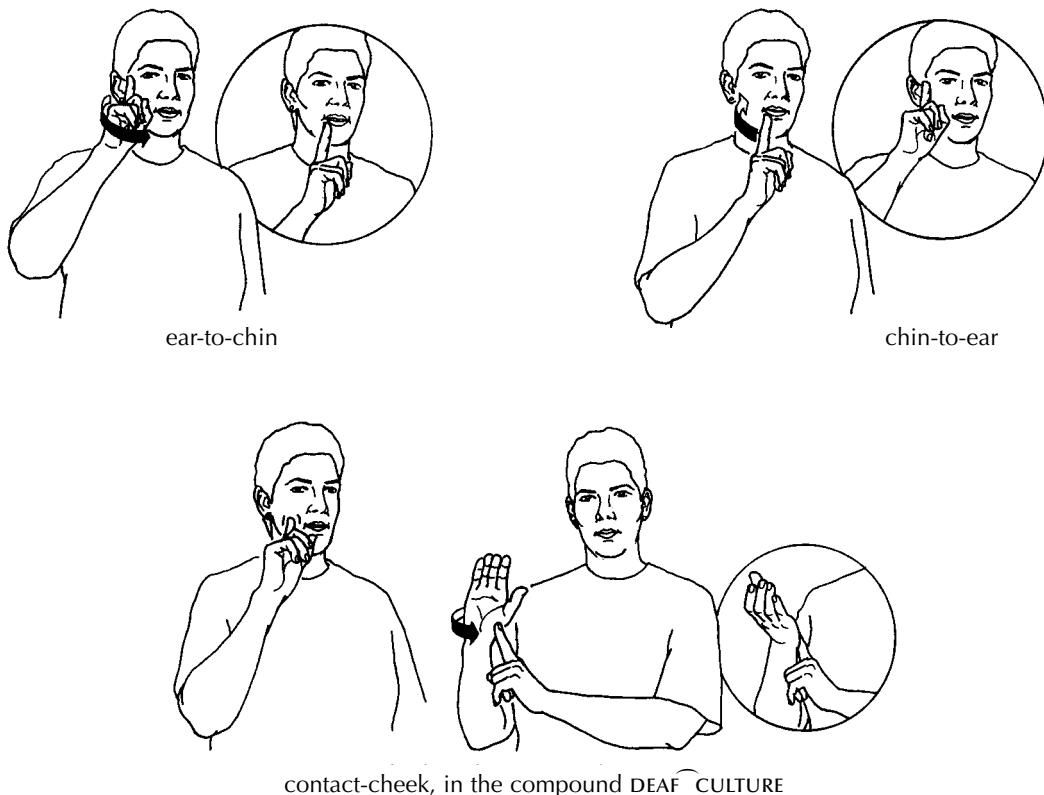


Figure 2. The three variants of **DEAF** analyzed in the sociolinguistic variation study.

and requirements of this kind of quantitative analysis. Then, we will describe how data were collected and how occurrences of the variants of **DEAF** were extracted from the videotaped data.

One of the main goals of the quantitative study of language variation is to understand linguistic phenomena and their relationship to social structure. We want to be able to understand, for example, the direction of linguistic change or the relationship between the form and the syntactic function of a class of signs. We also want to be able to test hypotheses about the relationships between different linguistic and social constraints, to compare alternative analyses, and to create models that allow us to make predictions (Guy 1993). Percentages of occurrence or non-occurrence of particular variants cannot ac-

count for many possible simultaneous influences on variation, both linguistic and social. To accomplish the goals of the study, then, Lucas et al. needed to use statistical procedures that could model simultaneously relationships between the many contextual factors that promote or inhibit use of a particular variant. In linguistics, the program known as VARBRUL, a specialized application of logistic regression, has been used most extensively for this type of modeling because it has been deliberately designed to handle the kind of data obtained in studies of variation. It also provides heuristic tools that allow the investigator to reanalyze the data easily as hypotheses are modified.⁶

Videotaped data for this study were collected during 1994 and 1995 at the seven sites mentioned earlier. All sites have thriving

Table 3. Demographic Characteristics of Informants in the Sociolinguistic Variation in ASL Study

| Characteristics | African-American Groups | | Anglo-American Groups | |
|----------------------|-------------------------|---------------|-----------------------|---------------|
| | Middle Class | Working Class | Middle Class | Working Class |
| Socioeconomic Status | | | | |
| Age | 15–25 | 15–25 | 15–25 | 15–25 |
| | 26–54 | 26–54 | 26–54 | 26–54 |
| | 55+ | 55+ | 55+ | 55+ |

communities of ASL users. Six groups of deaf ASL signers, all white, participated in Staunton, Frederick, and Bellingham. Six white groups and five African-American groups participated in Boston, Fremont, Kansas City, Olathe, and New Orleans. In total, 207 signers participated. Their social and demographic characteristics are summarized in Table 3.

Working-class participants had no education beyond high school and were working in blue-collar jobs. Middle-class participants had completed college and were working in professional positions. The age group divisions were designed to correlate roughly with changes in the language policies in deaf education over the last ninety years. Older participants would have had purely oral instruction in schools; the middle group was in school during Total Communication; younger participants would have begun school at the beginning of the return to using ASL in the classroom.

Groups of participants were videotaped in the three parts of the data collection sessions described above: conversation, sociolinguistic interview, and lexical variation elicitation. All tokens of the three variants of DEAF, a total of 1,618 occurrences, were extracted from this videotaped database for coding for multivariate analysis with VARBRUL. Each token was entered into the statistical database along with its values for social and linguistic factors. The following social factors were coded: region, age (15–25, 26–54, 55+), gender, ethnicity (African-American, white), class (working, middle), and language background

(native ASL, other). The linguistic factors coded were designed to provide a follow-up to Lucas's (1995) study, which found that the grammatical function of the sign was the most significant constraint on the form of DEAF. The coding scheme for the linguistic constraints is presented in Table 4.

Once coding was complete and the data were entered, VARBRUL estimated the factor values (or probabilities) for each contextual factor specified (e.g., the handshape of the preceding segment or the social class to

Table 4. Coding Scheme for Linguistic Constraints on DEAF

| |
|------------------------------------|
| Grammatical function of DEAF |
| noun |
| adjective |
| predicate adjective |
| compound |
| Location of the preceding segment |
| high (at ear or above) |
| middle (between ear and chin) |
| low (chin or below) |
| pause |
| Location of the following segment |
| high (at ear or above) |
| middle (between ear and chin) |
| low (chin or below) |
| pause |
| Genre of text in which DEAF occurs |
| conversation |
| narrative |

which a signer belongs). The program provided a numerical measure of the strength of each factor's influence, relative to other factors in the same group, on the occurrence of the linguistic variable under investigation. VARBRUL probability values range between 0 and 1.00. A factor value, or weight, between .50 and 1.00 indicates that the factor favors use of a variant relative to other factors in the same group. For example, in the results reported below, compounds (e.g., DEAF CULTURE), with a factor value of .66, favor use of noncitation (–cf) forms. A value between 0 and .50 indicates that the factor disfavors a variant. Thus, in the same results, predicate adjectives, with a factor value of .37, disfavor use of –cf forms of DEAF. The output also includes an input probability, a measure of the overall tendency of signers to use a particular variant. In the results below, the input value for –cf forms of DEAF is .743. This value reflects the fact that –cf forms were far more common in the data than +cf forms. Of 1,618 tokens analyzed, 1,118, or 69 percent, were –cf. Finally, the program provides several measures of goodness of fit between the model and the data (see Young and Bayley 1996, 272–73).

FINDINGS

This section summarizes the more important findings of the three studies that have provided the data for our discussions of the potential contributions and methods of variationist linguistics to our understanding of sign languages. The details of the studies are available in Hoopes (1998), Collins and Petronio (1998), Lucas, Bayley, and Valli et al. (forthcoming), and Bayley, Lucas, and Rose (2000).

Pinky Extension

In contrast to the other studies, Hoopes's study (1998) analyzed the occurrence of a

single phonological variable—pinky extension—in the signing of a single individual. Prior to this study, Lucas and others had observed that some signers extend their pinky during particular signs, contrary to the citation forms of these signs.

Hoopes's study sought to determine whether the occurrence of pinky extension was indeed variable and, if so, whether the frequency of occurrence correlated with any linguistic or social factors. As stated previously, a primary goal of sociolinguistic inquiry is to correlate social and economic factors (e.g., sex, age, race, education, etc.) with the frequency at which a variable occurs in a given subject's speech. To accomplish this goal, tokens must be collected from subjects in each sociolinguistic category under analysis. Why, then, would Hoopes undertake to study a single signer? The primary reason is that this was a pilot study to determine if pinky extension varied at all. Because our understanding of the structure of ASL is still emerging, it is often difficult at the outset of a sociolinguistic study to know whether the linguistic form under analysis is variable at all. In this case, it was entirely possible that the occurrence of pinky extension was subject to a categorical, as opposed to a variable, rule. Before a larger, and more expensive, study was undertaken, it was necessary to determine if pinky extension was in fact variable, and, if so, whether it could be correlated with any linguistic or social constraints.

The findings indicated that the frequency of occurrence of pinky extension upon signs did in fact vary, and that the frequency of occurrence correlated with linguistic factors (handshape and syntactic category) and the one social factor analyzed (degree of social distance). The most intriguing finding, however, was that pinky extension tended to co-occur with prosodic features of emphatic stress. Specifically, it

tended to occur (a) with lexemes used repeatedly within a discourse topic, (b) before pauses, and (c) with lexemes lengthened to almost twice their usual duration. This suggests that pinky extension is itself a prosodic feature of ASL that adds emphatic stress or focus to the sign with which it co-occurs. It is quite analogous to stress in spoken language, which is indicated by a stronger signal as a result of greater articulatory effort.

It should be noted that sociolinguistic methodology was crucial to this last finding—pinky extension played a prosodic function in the lect of the subject. Prosody has largely been ignored by linguists working within either the Chomskian or the earlier structuralist framework due to the tendency of these frameworks toward categorization. Prosody tends not to be subject to categorical rules. But, as Hoopes's study shows, when one searches for factors that constrain but do not absolutely determine the occurrence of a linguistic form, the patterning of prosodic features emerge.

Tactile ASL

Space does not permit a discussion of the findings pertaining to morphology, syntax, and discourse, so here we will focus on the differences and similarities of the phonological form of signs used in visual and Tactile ASL. (For a full account of this study, see Collins and Petronio 1998.) Signs were examined in terms of their handshape, location, movement, and orientation.

Early studies on visual ASL sought minimal pairs to determine the distinctive parts of signs. Minimal pairs were interpreted as providing evidence for three parameters: handshape, movement, and location. For instance, the signs DONKEY and HORSE use the same location and movement but differ in handshape; MOTHER and FATHER use the same handshape and movement but differ

in location; and SICK and TO-BECOME-SICK use the same handshape and location but differ in movement. Battison (1978) later identified a fourth parameter, orientation, based on pairs such as CHILDREN and THINGS. These two signs have identical handshape, movement, and location, but they differ in the palm orientation.

Using these four parameters, Collins and Petronio examined signs to see if there were any phonological differences when the signs were used in visual ASL and Tactile ASL. They found no variation or changes in the handshape parameter. The other three parameters (movement, location, and orientation) displayed the same type of variation due to phonological assimilation that occurs in visual ASL. However, although the same forms of variation occurred in Tactile ASL, this variation was sometimes due to (a) the receiver's hand being on the signer's hand and (b) the signer and receiver being physically closer to each other than they generally are in visual ASL. The signing space used in Tactile ASL is generally smaller than that used in visual ASL because of the physical closeness of the signers. This smaller space usually results in smaller movement paths in signs. In addition, because the signer's and receiver's hands are in contact, the signing space shifts to the area where the hands are in contact; correspondingly, the location of signs articulates in neutral space and also shifts to this area. The orientation parameter showed some variation that resulted from modifications the signer made to better accommodate the receiver. One change, unique to Tactile ASL, occurred with signs that included body contact. In addition to the signer's hand moving toward the body part, the body part often moved toward the hand in Tactile ASL. This adaptation allowed the receiver to maintain more comfortable tactile contact with the signer.

The variation, adaptations, and changes that Collins and Petronio describe are examples of linguistic change that has occurred and is continuing in the U.S. deaf-blind community. In the past several years the American Association of the Deaf-Blind has expanded its membership and many state chapters have been established. The opportunity for deaf-blind people to get together and make communities has resulted in sociolinguistic changes in ASL as deaf-blind people modify it to meet their needs. From a linguistic viewpoint, Tactile ASL provides us with a unique opportunity to witness the linguistic changes ASL is experiencing as the deaf-blind community adapts the language to a tactile mode.

Sociolinguistic Variation of DEAF

Lucas et al.'s ongoing study focuses on a number of sociolinguistic variables, among them variation in the form of the sign DEAF. To examine the constraints on this variable, Lucas et al. performed multivariate analysis of 1,618 tokens using VARBRUL. The results indicated that variation in the form of DEAF is systematic and conditioned by multiple linguistic and social factors, including grammatical function, the location of the following segment, discourse genre, age, and region. The results strongly confirmed the earlier finding of Lucas (1995), which showed that the grammatical function of DEAF, rather than the features of the preceding or following sign, is the main linguistic constraint on variation. In this section, we will focus on the role of the grammatical category because the results for this factor suggest that variation in ASL operates at a much more abstract level than has previously been documented. We will also briefly review the main results of the role of signer age and geographical region.

The three variants of DEAF might logically be related to one another in a number

of different ways, based on what is known about the history of ASL as well as observations of processes governing ASL compound formation (Liddell and Johnson 1986; see also Lucas, Bayley et al. forthcoming; and Bayley, Lucas, and Rose 2000, for details). The researchers in this study hypothesized that the variants were related to one another as follows: The citation or underlying form is ear-to-chin—in the first stage, this form undergoes metathesis and surfaces as chin-to-ear; in the second stage, the metathesized form undergoes deletion of the first element and surfaces as contact-cheek, a process that is especially common in compounds (e.g., DEAF CULTURE). This model of the processes underlying variation in the form of DEAF necessitated two separate quantitative analyses: +cf vs. -cf, including both chin-to-ear and contact-cheek, and chin-to-ear vs. contact-cheek. Note that citation forms were eliminated from the second analysis because only forms that have undergone metathesis are eligible for deletion of the first element.

The results of both analyses for the grammatical category factor group are shown in Table 5. The table includes information on the application value, or value of the dependent variable at which the rule is said to apply; the VARBRUL weight, or factor value; the percentage of rule applications; and the number of tokens of each factor. The table also includes the input value, the overall percentage of application, and the number of tokens in each analysis.

The results of the first analysis show that compounds favor ($p = .66$) and predicate adjectives disfavor ($p = .37$) noncitation forms. Nouns and adjectives slightly favor noncitation forms as well ($p = .515$). The results of the second analysis, which excluded citation tokens, show that compounds very strongly favor the noncitation variant, contact-cheek ($p = .85$). The results also show

Table 5. The Influence of Grammatical Category on Choice of a Form of DEAF

| Factor | VARBRUL Weight | % | N |
|--|----------------|----|-------|
| Analysis 1: +cf vs. -cf (application value: -cf) | | | |
| Noun, adjective | .515 | 71 | 1,063 |
| Predicate adjective | .370 | 58 | 361 |
| Compound | .660 | 81 | 194 |
| Total/input | .743 | 69 | 1,618 |
| Analysis 2: chin-to-ear vs. contact-cheek (application value: contact-cheek) | | | |
| Noun | .490 | 17 | 411 |
| Adjective | .403 | 10 | 191 |
| Predicate adjective | .338 | 12 | 299 |
| Compound | .850 | 56 | 151 |
| Total/input | .142 | 20 | 1,052 |

that adjectives and predicate adjectives that have undergone metathesis are unlikely to undergo deletion. Finally, as in the first analysis of citation vs. noncitation forms, the value for nouns ($p = .49$) is close to .50, which indicates that this factor has only a slight effect on signers' choice of a form of DEAF.

An obvious question arises from these results. Why should the grammatical category to which DEAF belongs have such a large effect on a signers' choices among the three variants, while other factors, such as the location of the following segment, have no significant effect? One possibility is that the grammatical constraints are a synchronic reflex of a change in progress that originates in compounds and then spreads to nouns and adjectives and finally to predicates. A change from ear-to-chin to chin-to-ear, beginning with compounds, a grammatical class that is most subject to change, is arguably a shift in the direction of greater ease of production. Such a change would conform to Kroch's (1978) model of change from below, which, at least in the case of consonants, tends to greater ease of articula-

tion. This explanation is supported by the fact that there are a number of ASL signs that move from chin to ear in their citation form. Only two of these, however, clearly allow metathesis. They are HEAD and MOTHER FATHER ("parents"). Metathesis is not allowed by other common signs with a phonological structure like DEAF, consisting of a hold, a movement, and a hold (e.g., INDIAN, HOME, YESTERDAY).⁷ The fact that metathesis is not allowed by most signs whose citation form is chin to ear (that is, signs that move up), while it is allowed by DEAF, where the citation form moves down, suggests that chin to ear movement is the less marked sequence. DEAF, then, may be undergoing a change from a more marked to a less marked form that is characterized by greater ease of production.

As we have noted, in addition to identifying significant linguistic constraints on DEAF, Lucas et al. also found significant social and geographic constraints. Although social class, gender, and language background proved not to be statistically significant, both age and region were highly significant. In conducting their analyses,

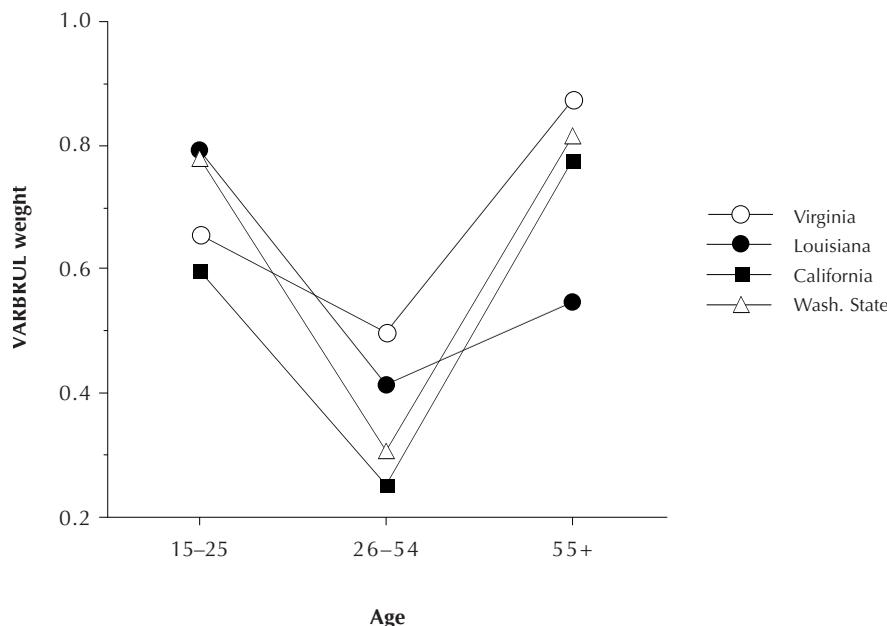


Figure 3. The dominant pattern of VARBRUL factor values for noncitation forms of DEAF by age and region.

Lucas et al. considered each age group within a region as a separate factor in order to investigate whether ASL was changing in the same way across the country or whether the direction of change differed from region to region. The results show interregional differences that Lucas et al. suspect are related to changes in deaf education policies in particular areas and to the complex relationships of residential schools to one another (Baynton 1996). However, in the analysis of citation vs. noncitation forms of DEAF, one dominant pattern emerged that was shared by four sites: In Virginia, Louisiana, California, and Washington state, both the youngest and the oldest signers were more likely to use noncitation forms of DEAF than signers aged 26–55. This dominant pattern is illustrated in Figure 3. Although much remains to be done, particularly in understanding the complex relationship of age and region to signers' choice of a variant of DEAF, the study demonstrates the potential

contribution that variationist linguistics can make to sign language research.

CONCLUSION

The methodologies and findings from the three distinct studies described here demonstrate the range of variation in sign languages and the diversity of approaches available for studying this variation. It is hoped that continued research on a variety of languages will enhance our growing understanding of sign language variation.

NOTES

1. Preston (1996) argues that, for members of the same speech community, linguistic constraints always have a greater effect on variation than do social factors.
2. For a thorough survey of this growing body of sociolinguistic research on sign languages, see Patrick and Metzger (1996).
3. In fact, variationist studies of spoken language communities have come under considerable criticism

- because they often rely on naive and outdated ideas of social categories such as class and gender (see, for example, Eckert 1989b; Santa Ana and Parodi 1998; and Williams 1992).
4. Issues of identity are likely to interact with other factors, and the salience of different aspects of personal identity is affected by the nature, setting, and topic of the conversational interaction. Thus, an individual may always be straight or gay, male or female, deaf or hearing, and so forth. However, not all aspects of the multiple characteristics that compose an individual's identity are always equally salient, a fact that is reflected in patterns of linguistic variation. Schilling-Estes (1999), for example, reported on an extended conversation between two university students in the South, one African-American and the other Native American. When the topic concerned their common experiences as members of ethnic minorities at a predominantly white institution, the two speakers showed very similar patterns of variation. When the topic shifted to the Civil War (during which the Native American student's tribe had supported the Confederacy), the two speakers diverged sharply. Further, the concept of dual ethnicity introduced by Broch (1987) is explored in Valli et al. (1992) in terms of language use by Deaf African-American signers, but not with specific reference to variation.
 5. The citation form (+cf) is the form of a sign as it would appear in a sign language dictionary or as it might be taught in a sign language class. The noncitation form (-cf) is the form of a sign as it might occur in everyday conversation, a variant of the +cf form. Of course, citation forms occur in everyday conversation as well.
 6. The statistical bases for the VARBRUL programs are set out in Sankoff (1988), and the procedures for using the software are explained in Young and Bayley (1996) and in the documentation that accompanies the programs. The present study used GoldVarb for the Macintosh (Rand and Sankoff 1990). Space does not permit a full explanation of the steps involved in a multivariate analysis with VARBRUL here. The topic is discussed in detail in the literature on the subject (e.g., Guy 1980, 1993; Rousseau and Sankoff 1978; Sankoff 1988; Young and Bayley 1996).
 7. There is some question as to whether HOME permits metathesis. Liddell and Johnson (1989) claim that it does, whereas there is disagreement among Deaf informants as to whether it does.
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Variation in American Sign Language

CEIL LUCAS AND ROBERT BAYLEY

1 INTRODUCTION

Even casual observation reveals that language users sometimes have different ways of saying or signing the same thing. Variation may be realized at all different levels of a language. English, for example, contains numerous examples of variation in the lexicon. Some American speakers use the word *couch*, while others say *sofa* or *davenport*. American Sign Language (ASL) also exhibits many well-known examples of lexical variation. For example, a number of signs exist for the concepts BIRTHDAY, PICNIC or HALLOWEEN.

At the phonological level, variation exists in the individual segments that make up words or signs or in parts of those segments. For example, speakers of a wide range of English dialects sometimes delete the final consonant of words that end in consonant clusters such as *test*, *round* or *past*, the result being *tes'*, *roun'* and *pas'* (Labov *et al.* 1968, Guy 1980). In ASL, phonological variation can be seen in all of the parts that make up signs—in the handshape, movement, location and palm orientation, and sometimes even in the nonmanual features that are part of sign production. The basic structure of these parts is discussed in other chapters of this volume.

Variation may also occur in the morphological and syntactic components of a language. For example, in African American

Vernacular English (AAVE), the copula *be* is variably deleted, and the sentences *He is my brother* and *He my brother* both occur. The example of consonant cluster reduction given earlier also concerns morphological variation because the final consonant deleted may be a past tense morpheme (i.e., a meaningful unit). For example, the phonetic realization of the English word *passed* is [paest], and the [t] is the realization of the past tense morpheme that may be variably deleted, although at a lower rate than when it is part of a monomorphemic word.

In ASL, the variable realization of the subject pronouns may serve as an illustration of syntactic variation. The ASL verb FEEL can be produced with an overt subject pronoun, as in the sentence PRO.1 FEEL, 'I feel.' ASL, however, is what is known as a "pro-drop language," and verbs that can take overt subject pronouns are sometimes produced without them so that the preceding sentence can be produced simply as FEEL, '(I) feel.' That is, the production of subject pronouns is variable and is likely to be an interesting area for research, as it has been in languages such as Chinese, Portuguese and Spanish (see, e.g., Flores-Ferrán 2007, Jia & Bayley 2002, Naro 1981, Otheguy, Zentella & Livert 2007).

Sociolinguistic variation takes into account the fact that the different linguistic variants may correlate with social factors in-

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cluding age, socioeconomic class, gender, ethnic background, region and sexual orientation. For example, older people may use a given variant more frequently than younger people; women may use a given variant less often than men; a given variant may occur more frequently in the language of working-class people than in the language of middle-class users. In addition, there are some social factors that are unique to Deaf¹ communities, such as the language policy of the school attended by signers (e.g., was ASL allowed or disallowed as the medium of instruction?) or the make-up of the signer's family (e.g., a Deaf ASL-using family or a hearing family that might or might not have used ASL).

This chapter will review the history of the study of sociolinguistic variation in ASL, describe the ways in which sign language variation parallels spoken language variation and discuss some ways in which modality differences may show up in variation.

2 PERSPECTIVES ON VARIATION IN SIGN LANGUAGES

2.1 Early perspectives on sign language variation

The formal education of the deaf in the United States began in 1817 with the establishment of the American School for the Deaf (ASD; originally called the American Asylum for the Deaf and Dumb) in Hartford, Connecticut. Classes were taught through signing. The first teacher at the school was Laurent Clerc, a young deaf Frenchman who had been recruited by Thomas Hopkins Gallaudet. Clerc used "manual French adapted to English" (Lane, Hoffmeister & Bahan 1996:56) along with the so-called "methodical signs" invented to represent the morphemes of spoken French or English that did not have counterparts in signing. (The use of these methodical signs

was abandoned fairly early on.) Lane, Hoffmeister and Bahan state that Clerc instructed the school's hearing teachers in the use of this manual French adapted to English and also gave private lessons "to nearly a dozen hearing teachers from as many eastern cities" (1996:56). In addition, some of the students brought their own sign systems to the school, such as the one used by both hearing and deaf people on Martha's Vineyard. The signing used at the school was not yet referred to as ASL, but as "the language of signs" (ASD 1818).

The establishment of the ASD was followed very quickly by the establishment of residential schools for deaf children in a number of states. Most of these schools were established by teachers and graduates of ASD, a development that is crucial to understanding the development of sociolinguistic variation in ASL. Lane, Hoffmeister and Bahan (1996:58) state:

In America, as in France, the mother school sent its teachers and Deaf graduates throughout the country to teach in various Deaf schools and to found new ones. As early as 1834, a single signed dialect was recognized in the schools for Deaf students in the U.S. [emphasis added]. By the time of Clerc's death in 1869, over fifteen hundred pupils had graduated from the Hartford school, and there were some thirty residential schools in the United States with 3,246 pupils and 187 teachers, 42 percent of them Deaf. Most such pupils and teachers married other Deaf persons and had children. This, too, helped to disseminate ASL.

Thus, the establishment of the residential schools—which until fairly recently have been powerful crucibles of Deaf culture and language use in the United States—led to a de facto standardization in ASL. But the establishment of these schools in the vast

geography of the United States in the nineteenth century also led fairly quickly to regional variation that was noticed by educators of the deaf. For example, in the proceedings of the fourth Convention of American Instructors of the Deaf held at the Staunton, Virginia, school in 1856, J. R. Keep (1857) describes how “teachers of the Deaf and Dumb” should acquire knowledge of signing:

It is answered in this inquiry that there is a language of signs; a language having its own peculiar laws, and like other languages, natural and native to those who know no other . . . *There may be different signs or motions for the same objects* [emphasis added], yet all are intelligible and legitimate, provided they serve to recall those objects to the mind of the person with whom we are communicating. As a matter of fact, however, although the Deaf and Dumb, when they come to our public Institutions, use signs differing in many respects from those in use in the Institutions, yet they soon drop their peculiarities, and we have the spectacle of an entire community recalling objects by the same motions. (p. 133)

In response to Keep’s remarks, Dunlap (in Keep 1857) compares the signs used at the Indiana School for the Deaf with those used at the Ohio and Virginia schools and notes a need for uniformity “not only in Institutions widely separated but among teachers in the same Institution” (p. 138). In another response to Keep’s remarks, Peet (in Keep 1857) refers to Deaf signers as “those to whom the language is *vernacular*” [emphasis added] and in a discussion of a class of signs described in current theory as classifier predicates or depicting verbs, states “Here is room for difference of dialects. One Deaf Mute may fall upon one sign and another upon another sign, for the same object, both natural” (pp. 144–146).

These writings provide a clear indication of early awareness of sign structure and variation, even though formal research in these areas did not begin until the 1960s.

2.2 VARIATION IN THE DASL

Following Stokoe’s 1960 paper on the structure of sign languages, *A Dictionary of American Sign Language on Linguistic Principles* (known as the DASL), published in 1965 by William Stokoe, Dorothy Casterline and Carl Croneberg, was the first comprehensive attempt to describe ASL signs from the standpoint of sign language structure. The signs appear in the dictionary not in the alphabetical order of the English words to which they correspond, but in order of the handshapes, locations and movements from which the signs are constructed. A comprehensive list of possible handshapes, locations and movements is provided along with a notation system for transcribing signs. The notion that the language used by Deaf people was a “real language,” analyzable in the same way that spoken languages are analyzed, was of course groundbreaking and even controversial for both hearing and deaf people. The notion was controversial because, after the 1817–1880 period that some have referred to as the Golden Age of ASL,² over eighty years of severe and harsh oralism followed during which the use of sign language as the medium of instruction for deaf education was largely forbidden (Baynton 1996). ASL and other sign languages had of course endured in Deaf communities around the world, but their status as real languages on a par with spoken languages was seriously damaged, in the case of ones that had been allowed to emerge, such as ASL, and totally unrecognized in the case of dozens of others.

Not only did the authors of the DASL claim that ASL was a real language, but the

volume also included two appendices by Carl Croneberg entitled “The linguistic community” (1965a) and “Sign language dialects” (1965b) that provide an introduction to ASL as it was actually used in the Deaf community. In “The linguistic community,” Croneberg describes the cultural and social aspects of the Deaf community and discusses the issues of economic status, patterns of social contact and the factors that contribute to group cohesion. These factors include the extensive networks of both a personal and an organizational nature that ensure frequent contact even among people who live on opposite sides of the country. Croneberg stated in 1965 that “there are close ties also between deaf individuals or groups of individuals as far apart as California and New York. Deaf people from New York on vacation in California stop and visit deaf friends there or at least make it a practice to visit the club for the deaf in San Francisco or Los Angeles . . . The deaf as a group have social ties with each other that extend farther across the nation than similar ties of perhaps any other American minority group” (1965a:310). And these ties of a personal nature are reinforced by membership in national organizations such as the National Association of the Deaf (NAD), the National Fraternal Society of the Deaf (NFSD), the National Black Deaf Advocates (NBDA) and the National Congress of Jewish Deaf (NCJD).

In “Sign language dialects,” Croneberg (1965b) deals with the issue of sociolinguistic variation as it pertains to the preparation of a dictionary. While the terms he chose were not precisely the ones that linguists working on spoken languages were using at the time, the constructs are analogous. He states that, “One of the problems that early confronts the lexicographers is dialect, and this problem is particularly acute when the language has never before been written.

They must try to determine whether an item in the language is *standard* [italics in the original], that is, used by the majority of a given population, or *dialect*, that is, used by a particular section of the population” (1965b:313). He outlines the difference between what he terms “horizontal” variation (regional variation) and “vertical” variation (variation that occurs as a result of social stratification) and states that ASL exhibits both. He then describes the results of a study of lexical variation based on a 134-item sign vocabulary list that he undertook in North Carolina, Virginia, Maine, New Hampshire and Vermont. He finds that for ASL, the state boundaries between North Carolina and Virginia also constitute dialect boundaries, in that North Carolina signs are not found in Virginia and vice versa. He finds the three New England states to be less internally standardized (that is, people within each of the three states exhibit a wide range of variants for each item) and the state boundaries in New England to be much less important, with a lot of overlap in lexical choice observed among the three states. He points out the key role of the residential schools in the dissemination of dialects, stating, “At such a school, the young deaf learn ASL in the particular variety characteristic of each local region. The school is also a source of local innovations, for each school generation comes up with some new signs or modifications of old ones” (1965b:314). Finally, in the discussion of vertical variation, he mentions age, ethnicity, gender, religion and social status as factors in variation. He views social status as a composite of economic level, occupation, educational background and relative leadership within the Deaf community. Croneberg’s focus is on lexical variation and he does not explicitly mention the possible role of modality in the observed variation.

Croneberg's appendices should be considered within the context of other variation research being undertaken at the same time. The years between 1958 (the year of publication of Fischer's pioneering study of sociolinguistic variation) and 1977 were very busy for spoken languages and sign languages alike. Labov's study of vowel centralization on Martha's Vineyard was published in 1963 and his pivotal study of New York City speech followed in 1966. Shuy, Wolfram and Riley completed their study of sociolinguistic variation in Detroit in 1968 and both Wolfram's dissertation on AAVE in Detroit and Labov's seminal article on the AAVE copula appeared in 1969 (see Hazen 2007 for a review). It was in this context that Georgetown University established a doctoral program in sociolinguistics in 1971. James Woodward, one of the program's first students, had worked with Stokoe, and his 1973 dissertation was the first to explore variation in a sign language. As Woodward states in the abstract, "This study attempts to utilize recent developments in variation theory in linguistics to analyze variation that occurs on the deaf diglossic continuum between American Sign Language and Signed English." His committee included Roger Shuy, Ralph Fasold and William Stokoe and his analysis of morphosyntactic variation in ASL was done within the framework of implicational scales developed by C. J. Bailey (1970, 1971).

2.3 AFTER THE DASL

The years following the publication of the DASL witnessed a number of studies of variation in ASL. In addition to Woodward's dissertation, phonological variation in the form of thumb extension was explored by Battison, Markowicz and Woodward (1975). Woodward, Erting and Oliver (1976) looked at signs that are produced variably on the

face or the hands, and Woodward and DeSantis (1977) examined signs that are variably one-handed or two-handed. DeSantis (1977) looked at location variation in signs variably signed at the elbow or on the hands, and while called a historical study, Frishberg (1975) looked at processes such as centralization still seen in ASL today, that is, signs usually produced at "high" locations (such as the face) or "low" locations (below the waist) being produced in the more central space in front of the signer. Morphological and syntactic variation have also been explored, as has lexical variation. As Patrick and Metzger (1996) note, however, until recent years most studies of variation in ASL, in contrast to the numerous community-based studies of spoken languages, involved very small samples. Indeed, fifteen of the fifty studies that they reviewed were based on only one or two signers. Only nine of those fifty studies included data from fifty or more signers, and several of the larger studies drew the same database.

All of the early studies of phonological variation in ASL explore both linguistic (internal) and social (external) constraints on the variation. Of particular relevance to the discussion here is that all of the linguistic constraints on the phonological variables are what Wolfram (personal communication, 1993) would call "compositional," that is, phonological features of the signs themselves that may be playing a role in the variation. For example, Battison, Markowicz and Woodward (1975) identified six internal constraints on thumb extension. Signs such as FUNNY or CUTE are produced in citation form with the index and middle fingers extended and all other fingers including the thumb closed, but the thumb may be variably extended. The six constraints identified were: (1) indexicality (i.e., is the sign produced contiguous to its referent, as in a pronoun or determiner); (2) bending of fingers

(i.e., do the other fingers involved in the sign bend, as in FUNNY); (3) middle finger extension (i.e., is the middle finger extended as part of the sign); (4) twisting movement (i.e., does the hand twist during the production of the sign, as in BORING); (5) whether the sign is produced on the face, as in BLACK or FUNNY; and (6) whether the sign is made in the center of one of the four major areas of the body. These studies had studies of spoken language variation as models and naturally looked for the same kinds of linguistic constraints that had been identified as operating in spoken language variation.

3 VARIATION IN SIGNED AND SPOKEN LANGUAGES

In fact, as can be seen in Table 20.1, the same kinds of variation found in spoken languages can also be found in sign languages. Specifically, the features of individual segments of signs can vary, individual segments

and whole syllables can be deleted or added, and parts of segments or syllables can be rearranged. There can be variation in word-sized morphemes (i.e., lexical variation) or in combinations of word-sized morphemes (i.e., syntactic variation). Finally, there can be variation in discourse units.

Two kinds of variation in sign languages, however, seem to be artifacts of a language produced with two identical articulators (i.e., two hands as opposed to one tongue). That is, sign languages allow the deletion, addition or substitution of one of the two articulators. Two-handed signs become one-handed (CAT, COW), one-handed signs become two-handed (DIE), and a table, chair arm or the signer's thigh may be substituted for the base hand in a two-handed sign with identical handshapes (RIGHT, SCHOOL). In addition, one-handed signs that the signer usually produces with the dominant hand (i.e., the right hand, if the signer is right-handed) can be signed with the

Table 20.1 Variability in spoken and sign languages

| Variable unit | Example | |
|---|---|--|
| | Spoken languages | Sign languages |
| Features of individual segments | Final consonant devoicing, vowel nasalization, vowel raising and lowering | Change in location, movement, orientation, handshape in one or more segments of a sign |
| Individual segments deleted or added | -t, d deletion, -s deletion, epenthetic vowels and consonants | Hold deletion, movement epenthesis, hold epenthesis |
| Syllables (i.e., groups of segments) added or deleted | Aphesis, apocope, syncope | First or second element of a compound deleted |
| Part of segment, segments, or syllables rearranged | Metathesis | Metathesis |
| Variation in word-sized morphemes or combinations of word-sized morphemes (i.e., syntactic variation) | Copula deletion, negative concord, <i>avoir/être</i> alternation, lexical variation | Null pronoun variation, lexical variation |
| Variation in discourse units | Text types, lists | Repetition, expectancy chains, deaf/blind discourse, turn taking, back-channeling, questions |

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non-dominant hand. Variation is also allowed in the relationship between articulators, as in HELP, produced with an A-handshape placed in the upward-turned palm of the base hand. Both hands can move forward as a unit, or the base hand can lightly tap the bottom of the A-handshape hand.

Perhaps more important to the examination of possible modality differences in sign language variation are the internal constraints that operate on variation. Table 20.2 compares the constraints in spoken and sign variation.

As mentioned previously, early studies of variation in ASL focused on compositional constraints, that is, the variation was seen to be conditioned by some feature of the variable sign itself. Sequential constraints are those that have to do with the immediate linguistic environment surrounding the variable, such as the handshape, location or palm orientation of the segment immediately preceding or following the target sign. Functional constraints pertain to the role that the sign's grammatical category plays in the variation, while the constraint of structural incorporation has to do with the preceding or following syntactic environment surrounding the variable. Finally, pragmatic features such

as emphasis may help explain the variation observed.

Analyses of variation in sign languages subsequent to those undertaken in the 1970s continued to look to spoken language analyses for models of how to account for the variation. And they looked to explanations in which sequential constraints are the focus of the explanations. Liddell and Johnson, for example, explain variation in two forms of the sign DEAF (ear to chin and chin to ear) as a process governed solely by phonological constraints: “A number of signs exchange an initial sequence of segments with a sequence of final segments in certain contexts that appear to be purely phonological. The sign DEAF is typical of such metathesizing signs” (1989:244). They also describe the central role of the location of the preceding sign, such that the first location of the sign DEAF in the phrase FATHER DEAF would be produced at the ear, close to the forehead location of the sign FATHER, while in MOTHER DEAF, the first location of DEAF would be produced at the chin, the same location as the sign MOTHER (p. 245).

Liddell and Johnson (1989) also comment on the variable lowering of signs (e.g., KNOW) that are produced at the level of the forehead in citation form: “[T]he phono-

Table 20.2 Internal constraints on variable units

| Constraint | Example | |
|--------------------------|--|--|
| | Spoken | Signed |
| Compositional | Phonetic features in nasal absence in child language | Other parts of sign in question (e.g., handshape, location, orientation) |
| Sequential | Following consonant, vowel, or feature thereof | Preceding or following segment or feature thereof |
| Functional | Morphological status of -s in Spanish -s deletion | Function of sign as noun, predicate, or adjective |
| Structural incorporation | Preceding or following syntactic environment for copula deletion | Syntactic environment for pronoun variation |
| Pragmatic | Emphasis | Emphasis (e.g., pinkie extension) |

Source: Reprinted with permission from Lucas, Bayley and Valli 2001:29.

logical processes that originally must have moved them are still active in contemporary ASL. The rules which account for [these signs] appear to be variably selected in casual signing, and like the vowel reduction rules in spoken languages, have the effect of neutralizing contrasts of location" (p. 253). In addition, they attribute variation in signs produced with a 1-handshape (index finger extended, all other fingers and thumb closed) to phonological processes, again with a focus on constraints of a sequential nature: "There are numerous instances of assimilation in ASL. For example, the hand configuration of the sign ME (= PRO.1) typically assimilates to that of a contiguous predicate in the same clause" (p. 250).

4 QUANTITATIVE SOCIOLINGUISTICS AND ASL

4.1 Multivariate analysis of variation

Studies of variation in spoken languages have long been based on the assumption that variation is likely to be the result of not one, but multiple factors, both internal (or linguistic) and external (or social). For example, the "*-ing*" variable in English (whether a speaker says *workin'* or *working*) is constrained by the grammatical category of the word in which the variable appears (e.g., progressive participle or nominal) as well as by the social class and gender of the speaker (Trudgill 1974, Houston 1991), while studies of variable *-t*,*-d* deletion in English have typically considered the grammatical category of the segment subject to deletion as well as the preceding and following phonological environments and syllable stress, among other factors. The majority of studies of linguistic variation have used VARBRUL, a specialized application of the multivariate statistical procedure known as logistic regression (Bayley 2002, Tagliamonte 2007). VARBRUL is specifically designed to handle the kind of data col-

lected in studies of variation. It provides factor values (loosely called probabilities) for each contextual factor specified and a numerical measure of the strength of each factor's influence, relative to the other factors in the same group, on the occurrence of the linguistic variable. If, for example, the variable being investigated is pinkie (little finger) extension as in the signs YESTERDAY or BORING, VARBRUL allows the researcher to identify factors such as the handshapes of the preceding and following signs as possible factors in the variation, along with other factors such as the grammatical category of the variable sign, the kind of discourse it occurs in and so forth. In addition VARBRUL includes procedures for determining which factors contribute significantly to the observed variation and which do not.

Lucas (1995), an investigation of variation in the sign DEAF that served as the pilot for the larger study reported in Lucas, Bayley and Valli (2001), is among the earliest studies to adapt the multivariate methods of analysis developed to study spoken languages to the study of signed languages. The pilot study of DEAF was based on 489 tokens collected in 1993. The results were surprising in at least two respects. First, contrary to her expectation that there would be two variants, the citation ear to chin form and the metathesized chin to ear variant, Lucas found numerous instances of a third variant: DEAF produced as a simple contact of the tip of the index finger on the cheek. All three variants were included in the database and, following Liddell and Johnson (1989), coded for the location of the preceding and following signs. In addition, Lucas coded for the grammatical category of the sign DEAF itself. The sign DEAF of course functions as an attributive adjective, as in the phrases DEAF CAT or DEAF MAN. However, it can also function as a noun, as in the sentence DEAF UNDERSTAND ('The deaf understand') and as

a predicate adjective, as in the sentence PRO.1 DEAF ('I am deaf'). In addition, it occurs in a number of compound nominals such as DEAF^PEOPLE, DEAF^WORLD, DEAF^WAY, and DEAF^INSTITUTION (meaning residential school for the deaf). Finally, the data were coded for the relative formality or formality of the context.

The second surprise came in the quantitative analysis. Even though she coded for the grammatical category of the sign DEAF, Lucas fully expected the VARBRUL results to confirm earlier claims that the metathesis was due to the location of the preceding or following sign. As it turned out, however, the phonological factors—the location of the preceding and following signs—failed to reach statistical significance, as did formality or lack thereof. What was significant was grammatical category, whether the sign was an attributive adjective, a noun or predicate adjective, or part of a compound (referred to at that time as a “fixed phrase”). Thinking that this might be the result of a small number of tokens, plans were made to replicate the analysis with a larger dataset. But it was intriguing, to say the least, that the statistically significant key factor in explaining the variation was grammatical category rather than the expected phonological factors.

4.2 VARIATION IN ASL RECONSIDERED

In 1994 Lucas and Valli began a study of variation in ASL with large-scale spoken language studies as models. They were joined by Bayley in 1997. The overall goal of the study was to describe phonological, morphosyntactic and lexical variation in ASL as used throughout the United States, and to document the correlations of variation with external constraints such as region, age, gender, ethnicity, socioeconomic status and also factors pertaining specifically to the Deaf community such as school language policies

and language use in the home. The data collection methodology and the findings of the study have been widely reported and will not be reviewed here. The part of the study that we will focus on here concerns the behavior of specific linguistic constraints and what their behavior might reveal about modality differences between spoken language and sign language variation.³ (See Lucas *et al.* 2001 for a full account of the linguistic and social constraints.)

The constraints of concern here relate to the three phonological variables analyzed: the sign DEAF, the location of a class of signs represented by the verb KNOW and signs made with a 1-handshape. As shown in Figures 20.1a, 20.1b and 20.1c, DEAF has three main variants. In the citation form, DEAF is signed from ear to chin. DEAF may also be signed from chin to ear or reduced to a contact of the index finger on the cheek. As illustrated in Figures 20.2 and 20.3, signs represented by KNOW and FOR are produced in citation form at the level of the forehead but can be produced at the level of the cheek, jaw or even in the space in front of the signer. 1-handshape signs exhibit a wide range of variation, from thumb open to all fingers and thumb open and variants between these two. Lucas *et al.* (2001) examined 1,618 tokens of DEAF, 2,594 of signs in the KNOW class and 5,195 1-handshape signs. And following both spoken language studies and earlier analyses of variation in ASL, the linguistic constraints included in the analysis pertained to the linguistic environment immediately surrounding the variable sign. For DEAF, this meant the location of the preceding and following signs, as in the example discussed earlier—FATHER produced on the forehead as opposed to MOTHER produced on the chin. For signs like KNOW, since the focus is on variability in location, this meant the location of the preceding and following



Figure 20.1a DEAF: Citation form.



Figure 20.1b DEAF: Chin-to-ear variant.

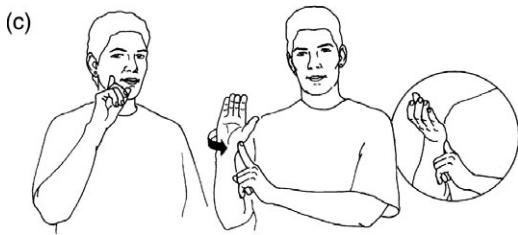


Figure 20.1c DEAF: Contact cheek variant, in the compound DEAF^CULTURE.

signs and also whether or not the preceding or following sign had contact with the head or the body. For 1-handshape signs, this meant the handshape of the preceding and following signs. Other linguistic constraints were also included and the motivation for their inclusion requires some historical background.

Based on the results of Lucas (1995), all three phonological variables examined in the large-scale study—DEAF, signs like KNOW and 1-handshape signs—were coded for grammatical category, and once again this emerged as the most significant factor, confirming the 1995 results. In VARBRUL, the values of the factors range between 0 and 1.00. A factor value, or “weight,” between .50 and 1.00 indicates that the factor favors the use of a variant relative to other factors in the group. A factor value at .50 in-

dicates that the factor is relatively neutral toward the use of the variant, while a factor value under .50 indicates that the factor disfavors the use of the variant. Table 20.3 shows that compound forms with the sign DEAF favor a non-citation form, predicate adjectives disfavor non-citation forms, and nouns and adjectives constitute a nearly neutral reference point. The other significant factor, discourse genre, shows that non-citation forms tend to occur more in narratives than in conversation. (It should be noted that when the two non-citation forms of DEAF are compared, the phonological factor of the location of the following sign is significant.)

The VARBRUL results for location variation in signs like KNOW are seen in Table 20.4.

Once again, while the phonological factors preceding location and following contact are significant, grammatical category emerges as the most important factor, with prepositions and interrogative signs favoring lowered forms, and nouns, verbs and adjectives disfavoring them. Table 20.5 summarizes the rankings of the linguistic constraints for all three variables and shows that grammatical category is the most powerful factor for all three.

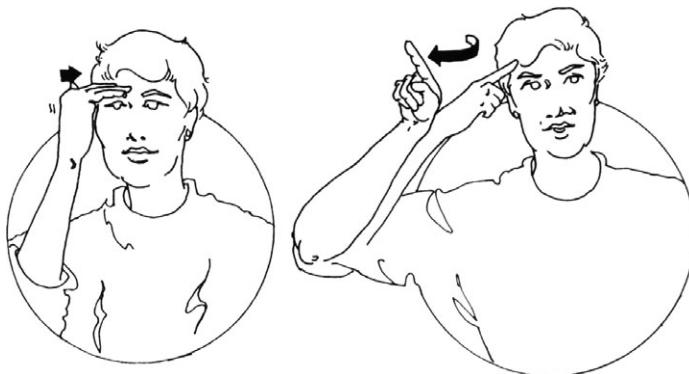


Figure 20.2 KNOW and FOR: Citation forms.



Figure 20.3 KNOW and FOR: Non-citation forms.

Table 20.3 Variation in the form of DEAF: +cf vs. -cf (application value: -cf)

| Factor group | Factor | Weight | 5 | n |
|----------------------|------------------------|--------|----|------|
| Grammatical category | Noun, adjective | .515 | 71 | 1063 |
| | Predicate | .370 | 58 | 361 |
| | Compound | .660 | 81 | 194 |
| Discourse genre | Conversation | .489 | 69 | 1489 |
| | Narrative | .628 | 74 | 129 |
| Total | Input (corrected mean) | .743 | 69 | 1618 |

Note: $\chi^2/\text{cell} = 1.2952$, all factor groups significant at $p < .05$; the application value is the form of sign that counts as an application of the “rule” being investigated, in this case, the -cf, non-citation form.

Source: Reprinted with permission from Lucas and Bayley (2005:56).

Table 20.4 Variation in the location of signs represented by KNOW:
linguistic factors

| Factor group | Factor | Weight | % | n |
|----------------------|----------------------------|--------|----|------|
| Grammatical category | Preposition, interrogative | .581 | 59 | 485 |
| | Noun, verb | .486 | 52 | 2052 |
| | Adjective | .316 | 35 | 57 |
| Preceding location | Body | .503 | 53 | 1648 |
| | Head | .452 | 48 | 614 |
| Following contact | No contact | .525 | 55 | 1323 |
| | Contact | .466 | 48 | 991 |
| Total | Input (corrected mean) | .518 | 53 | 2594 |

Note: $\chi^2/\text{cell} = 1.1702$; all factor groups are significant at $p < .05$; results for preceding location and following contact do not include pauses, which were tested in separate factor groups that proved not to be significant.

Source: Reprinted with permission from Lucas and Bayley (2005:56).

Table 20.5 Summary of linguistic constraints on phonological variation in ASL

| Variable | Analysis | Constraint ranking |
|------------------------|-------------------------------|---|
| DEAF | +cf vs. -cf | Grammatical category > discourse genre |
| | Chin-to-ear vs. contact-cheek | Grammatical category > location of following segment (assimilation) |
| Location of KNOW, etc. | +cf vs. -cf | Grammatical category > contact with body of following sign > location of preceding sign |
| 1-handshape | +cf vs. -cf | Grammatical category > features of preceding and following handshapes (assimilation) |
| | L-handshape vs. all others | Features of preceding and following handshapes (assimilation) > grammatical function |
| | Open hand vs. all others | Grammatical category > features of preceding and following handshapes (assimilation) |

Source: Reprinted with permission from Lucas and Bayley (2005:61).

The influence on variation of factors other than features of the preceding and following signs discussed here has also been found in other studies of ASL. Hoopes (1998), for example, completed a small-scale study of signs such as THINK, WONDER and TOLERATE. In citation form, all of these signs are signed with the pinkie closed. However, they are sometimes produced with the pinkie extended. While we might expect pinkie extension to be governed by the handshape of the preceding or following sign, based on earlier claims, pinkie extension appears to be a prosodic feature of ASL that adds emphasis or focus to the sign with which it co-occurs.

In another study, Mulrooney (2002) investigated variation in fingerspelling with the goal of determining what governs the production of non-citation forms of the individual signs that make up a fingerspelled word. Again, one might expect the immediate phonological environment to play some role, specifically the handshape of the immediately preceding or immediately following sign. However, neither of these turned out to have a significant effect. The immediately preceding and following locations had modest influence, but once again the strongest role was played by the grammatical category of the fingerspelled word in which the

target form occurred, with proper nouns favoring citation forms, common nouns neither favoring nor disfavoring citation forms, and verbs favoring non-citation forms. Finally, as discussed in this volume, the influence of grammatical category on phonological variation has also been observed in Australian Sign Language (Auslan) (Schembri, Johnston & Goswell 2006), so this phenomenon is not limited to ASL.

For the social factors, we will look at the results for a class of signs made at the forehead in citation form (e.g., KNOW). Table 20.6 shows that gender, region, age, language background and ethnicity were found to significantly affect the location of the signs in the analysis. The results show that older signers disfavor the lowered forms (.416), signers in the middle group neither favor nor disfavor the lowered forms (.517) and the younger signers favor the lowered signs (.602). Signers in the relatively rural data collection sites of Washington State and Virginia, all of whom were White, disfavor the lowered signs, while signers in the other five areas favor them. Signers from deaf families who acquired ASL natively disfavor the low-

ered signs, while signers from hearing families are neutral. Female signers tend to be conservative and disfavor lowered signs, while male signers slightly favor them. African American signers also disfavor the lowered signs. So, in sum, we see that social factors clearly play a role in explaining the variation, including a factor—language background—that is unique to Deaf communities. Of these social factors, gender, region, age and ethnicity have also been found to have significant roles in explaining spoken language variation, so this gives us important perspective on variation in human languages, be they spoken or signed. And given the distinct history of the education of deaf children in the United States, the fact that language background has a role in explaining variation in ASL is not at all surprising. We found that social factors also played a key role in the sign DEAF and 1-handshape signs, the other variables that we examined.

5 THE ROLE OF MODALITY IN VARIATION

Spoken languages have been the focus of most studies of sociolinguistic variation, but

Table 20.6 Effect of social factors on variation in the location of signs like KNOW (application value: -cf)

| Factor group | Factor | Weight | % | n |
|---------------------|--------------------------------|--------|----|-------|
| Age | 15–25 | .602 | 61 | 554 |
| | 26–54 | .517 | 54 | 1,133 |
| | 55+ | .416 | 46 | 907 |
| Language background | Hearing parents | .519 | 53 | 1940 |
| | Deaf parents | .444 | 52 | 654 |
| Region | CA, LA, MD, KS/MO | .529 | 54 | 2055 |
| | Washington State | .461 | 56 | 259 |
| | Virginia | .334 | 40 | 280 |
| Gender | Male | .544 | 56 | 1376 |
| | Female | .451 | 49 | 1218 |
| Ethnicity, SES | White middle and working class | .555 | 56 | 1882 |
| | African American middle class | .445 | 55 | 257 |
| | African American working class | .314 | 40 | 455 |
| Total | Input (corrected mean) | .518 | 53 | 2594 |

Notes: $\chi^2/\text{cell} = 1.1702$; all factor groups significant at $p < .05$; no African Americans participated in Virginia and Washington State. African American middle-class signers include persons aged 15–54.

the work that has been accomplished on sign languages has given rise to a basic theoretical question: “In what way, if any, is modality reflected in variation?” That is, does sociolinguistic variation in sign languages exactly parallel what has been described for spoken languages? Or is the fact that sign languages are produced with the hands, face and body as opposed to with the vocal apparatus manifested in the sociolinguistic variation that sign languages exhibit? Do visual-gestural sign languages and oral-aural spoken languages differ in fundamental ways when it comes to sociolinguistic variation? And what of the constraints, both linguistic and social, on this variation? The main question emerging from Lucas *et al.* (2001) is why do grammatical and prosodic constraints seem to have a more important role than the features of the preceding and following signs in conditioning phonological variation in ASL? The first answer is simply that, as in spoken languages, phonological variation in ASL is not constrained exclusively by phonological factors. The focus heretofore may have been on features of the preceding and following signs, but large data-based quantitative studies such as the one undertaken by Lucas *et al.* show that grammatical factors must also be considered.

A second answer concerns differences between spoken and sign languages. Having established that sign languages are indeed “real” languages, research on all aspects of sign language structure has begun to show some fundamental and most likely modality-related differences between spoken and sign languages. Of most relevance to the present discussion are the basic differences in how morphology functions and how the differences manifest themselves in variation. In many of the spoken languages in which phonological variation has been extensively explored, morphology is a “boundary phe-

nomenon.” That is, meaningful segments are added to the beginning or end of other units in the language in the form of plural markers, person and tense markers, derivational affixes and so forth. These units are essentially added to an existing phonological environment. It stands to reason that when variation occurs, a good place to look for the cause of this variation is the immediate environment to which units have been added (i.e., the preceding and following segments). In fact, many studies of spoken language variation have demonstrated the key role of the immediate phonological environment in governing variation.

However, as seen in other chapters in this volume, morphology in sign languages is by and large not a boundary phenomenon, at least not to a great extent. There exist very few sequential affixes. Morphological distinctions are accomplished by altering one or more features in the articulatory bundle that makes up a segment or by altering the movement path of the sign. For example, segments are not usually added to other segments to provide information about person or aspect. Rather, the location feature of a segment (e.g., near or away from the signer) indicates person, and movement between locations indicates the subject and object of the verb in question. Similarly, a particular movement path indicates continuative or inceptive aspect. As Emmorey (1999b:173) states with specific regard to aspect marking in ASL:

In many spoken languages, morphologically complex words are formed by adding prefixes or suffixes to a word stem. In ASL and other signed languages, complex forms are most often created by nesting a sign stem within dynamic movement contours and planes in space . . . ASL has many verbal inflections that convey temporal information about the action denoted by the verb, for example, whether

the action was habitual, iterative, continual. Generally, these distinctions are marked by different movement patterns overlaid onto a sign stem. This type of morphological encoding contrasts with the primarily linear affixation found in spoken languages. For spoken languages, simultaneous affixation processes such as template morphology (e.g. in Semitic languages), infixation, or reduplication are relatively rare. Signed languages, by contrast, prefer nonconcatenative processes such as reduplication; and prefixation and suffixation are rare. Sign languages' preference for simultaneously producing affixes and stems may have its origins in the visual-manual modality.

The results presented in Lucas *et al.* 2001 indicate that these fundamental differences manifest themselves in the variable components of the language. That is, the immediate phonological environment turns out not to play the major role in governing phonological variables, in part because the variables themselves are not affixes. The grammatical category to which the variable in question belongs is consistently the first-order linguistic constraint. (In this regard, see also Brentari 2002.)

This finding has important implications for our understanding of variation in spoken and signed languages. As the modality differences between spoken and signed languages manifest themselves in the basic phonological, morphological and syntactic components of the language, so they also seem to appear in the patterns of linguistic variation. As the phonological and morphological processes go, so apparently goes variation.

The question arises as to the parallels between ASL and spoken languages (e.g., Chinese) that, like ASL, do not use inflectional morphology to any great extent. The gist of the question is whether the variation in these spoken languages resembles that in

ASL, specifically with respect to the prominent role of grammatical factors in governing the variation. Or do other features, such as the extremely widespread compounding that characterizes Chinese and the resulting tone sandhi lead to patterns that differ from those of inflected spoken languages on one hand and signed languages on the other? In the absence of a substantial number of studies of sociolinguistic variation in Chinese and other languages that have no or only minimal inflectional morphology (see, for example, Bourgerie 1990, Zhang 2001), we cannot rule out modality differences as a contributing factor to the patterns reported here. At this point, the role of grammatical factors in conditioning phonological variation in ASL seems to be best described as a matter of degree. There clearly are grammatical constraints on spoken language phonological variation, and features of the preceding and following signs obviously influence variation in sign languages.

The analyses of Lucas *et al.* (2001) suggest that modality differences may play a role in accounting for a difference in the relative importance of the constraints. In the variation in phonological features observed thus far in sign languages, grammatical constraints are consistently more important than phonological ones. Ironically, it may be the visual nature of sign languages that reinforces the impressions and hypotheses that phonological variation in sign languages is governed by constraints having to do with the features of the preceding and/or following segments. That is, we can actually *see* the lower and higher locations that precede and follow DEAF and signs such as KNOW; we can *see* the handshapes that precede and follow 1-handshape signs. Being able to see the phonological environment surrounding the variation easily leads to hypotheses about this environment accounting fully for the variation, but these hypoth-

eses are simply not supported by the data. However, recent work suggests that it is too early for large-scale generalizations about the role of grammatical category. Goeke (2006), for example, examined two-handed ASL signs that can become one-handed, such as DEER, WANT and SURPRISE. She coded 611 tokens from eighteen female signers in Kansas, Louisiana and Maryland extracted from the corpus collected for Lucas *et al.* (2001). Goeke examined the possible influence of presence of internal movement in the target sign, contact of the target sign with the body (or not), grammatical category of the target sign, handshape of the target sign (unmarked or marked), and handedness of the preceding and following sign (two-handed or one-handed). Only contact and handedness of the preceding and following sign were found to be significant. To wit, one-handed signs were favored by a contact with the body and one-handed signs or pauses preceding and following the target. The relevant linguistic influences were purely phonological, as the grammatical category of the target sign was not found to be significant. In addition, Goeke found that younger signers (under 55) were more likely to use the onehanded variant than were signers over 55.

On the basis of Goeke's (2006) results, we expanded the investigation of variation between two-handed and one-handed variants with additional data from Lucas *et al.* (2001). Multivariate analysis of 2,258 examples from California, Kansas/Missouri, Louisiana and Massachusetts confirmed Goeke's findings for the significance of contact of the target sign with the body and the preceding and following signs (Lucas, Goeke, Briesacher & Bayley 2007). With a larger dataset, however, grammatical category also reached statistical significance, although it was the least important of the linguistic constraints selected. Content signs (verbs, nouns, adjectives and adverbs) slightly disfavored the one-handed variant, while signs indicating grammatical function and exclamations (e.g., WH-, THAT, WOW) strongly favored the one-handed form. In addition, results showed that African American signers used significantly fewer one-handed variants than White signers. Finally, the results provide evidence of a change in progress. Signers under 55 chose the one-handed variant at a rate of 51 percent, compared to only 36 percent for signers over 55. Results for Lucas *et al.* (2007) are shown in Table 20.7.

Table 20.7 Variation in 1-handed and 2-handed signs (linguistic constraints only, application value = 1-handed variant)

| Factor group | Factor | Weight | % | n |
|--|------------------------------|--------|----|------|
| Following sign | pause, 1-handed | .564 | 54 | 1547 |
| | 2-handed | .393 | 35 | 711 |
| Preceding sign | pause, 1-handed | .552 | 53 | 1416 |
| | 2-handed | .388 | 35 | 842 |
| Contact of target sign with head or body | Contact | .613 | 67 | 628 |
| | No contact | .456 | 43 | 1630 |
| Grammatical category | Other (e.g., WH-, THAT, WOW) | .664 | 62 | 151 |
| | N, V, Adj, Adv | .488 | 46 | 2107 |
| Total | Input (corrected mean) | .468 | 47 | 2258 |

Note: $\chi^2/\text{cell} = 1.1899$; all factor groups are significant at $p < .05$; factors that did not differ significantly from one another have been combined where there was linguistic justification for doing so.

The results from Lucas *et al.* (2007) may be interpreted in at least two different ways. First, the results suggest that we need to be cautious in discussing modality differences as they affect phonological variation in sign languages. To date, relatively few phonological variables have been systematically examined using the kind of large corpora typically found in studies of variation in spoken languages, and only two signed languages have been studied, ASL and Auslan. Further studies of ASL, Auslan and other sign languages may reveal findings that more closely resemble our study of alternation between one-handed and two-handed variants of ASL signs than the results found in Lucas *et al.* (2001) (cf. Schembri *et al.*, this volume). Note, however, that the variables examined in Lucas *et al.* (2001), where grammatical category did play the major role in conditioning variation, varied in a single parameter, e.g., location or handshape. In contrast, alternation between onehanded and two-handed variants involves the deletion of an articulator. A second explanation may well be that the influence of the preceding and following signs is stronger in cases where an articulator is deleted. It may point to how quantity behaves differently than quality. That is, the number of articulators involved (twohanded signs vs. one-handed) may be more subject to phonological constraints, while what the articulators are doing in terms of their handshape, location, palm orientation and movement may be more subject to grammatical constraints.

6 WHERE DO WE GO FROM HERE?

One area that definitely warrants more investigation is the definition and description of distinct subsystems or varieties, that is, sets of linguistic features that co-occur predictably—also referred to as dialects—as opposed to the description of individual vari-

able linguistic features across communities. Two such varieties are currently under investigation. Collins and Petronio have examined Tactile ASL, the variety of ASL used by Deaf–Blind people, specifically those with the genetic condition, Ushers Syndrome I. Individuals with this syndrome are born deaf and later, usually in their teens, start losing vision in varying degrees due to retinitis pigmentosa. Crucially, most Deaf–Blind people in this category grow up using ASL and are fluent signers by the time that they begin to lose their sight. A variety of ASL has emerged in this community that accommodates the loss of sight at all linguistic levels: phonological, morphological, syntactic and discourse. One of the consequences of the loss of sight is that Deaf–Blind people no longer have access to the numerous ASL grammatical and discourse markers produced on a signer's face. Remarkably, these nonmanual (facial) markers are produced on the hands in Tactile ASL. For example, the raised eyebrows required for yes/no questions or the nodding required for back-channeling are produced manually (see Collins & Petronio 1998 and Collins 2004 for fuller accounts). As mentioned, features of Tactile ASL are manifested at every level of the language, and there is a substantial community of Deaf–Blind signers who use Tactile ASL. Tactile ASL qualifies as a clear example of a variety of ASL. In addition, research has demonstrated the existence of tactile varieties of other sign languages such as Swedish Sign Language (Mesch 2000) and Norwegian Sign Language (Raanes 2006).

Another such variety is what is commonly referred to as Black ASL. While there is a widespread perception in the American Deaf community of the existence of Black ASL and mostly anecdotal reports that it is as distinct from the ASL used by White signers as AAVE is from middle-class White En-

glish, empirical descriptions of Black ASL based on natural language use data do not yet exist. Hairston and Smith (1983:55) comment that there is “a Black way of signing used by Black deaf people in their own cultural milieu—among families and friends, in social gatherings, and in deaf clubs.” Based on lexical data, Woodward (1976) described a variety of ASL, used by Black Deaf adults in the South, that arose in part in the schools for Black Deaf children and existed before desegregation. However, no data exist to document empirically its structure and use in any way comparable to the extensive data collected for AAVE. Over forty years of research findings have documented the structure and use of AAVE in rich detail. AAVE has been shown to be a rule-governed and systematic variety of English distinct in its structure from other varieties of English, a variety that acquired its distinctiveness over a long period of time and as a result of the interaction of many historical and social forces (see Mufwene *et al.* 1998 and Green 2004 for reviews of the AAVE literature). Furthermore, not only linguists but also both Black and White laypersons recognize AAVE as distinct from other English varieties. While laypersons may use different labels from linguists to identify this variety (e.g. “Ebonics”), they nevertheless easily and clearly perceive it to be distinct from middle-class White English as well as from other varieties of English. Moreover, laypersons’ perceptions of distinctiveness are solidly confirmed by many empirical descriptions of AAVE structure and use.

The same kind of research needs to be conducted on Black ASL. Differences between Black and White signing have been noticed by researchers for at least forty years. Linguistic descriptions of the differences between Black and White signing focus primarily on Black signers in the South. For

example, in his appendices to the 1965 DASL, Croneberg discusses these differences as a consequence of the segregation of deaf schools in the South. Based on responses to a 134-item sign vocabulary list, he reports “a radical dialect difference between the signs” of a young North Carolina Black woman and those of White signers living in the same city (1965b:315). In comparing signs that can be produced on the face or on the hands (e.g., RABBIT, LEMON, COLOR),⁴ Woodward, Erting and Oliver (1976) claimed that White signers produced more variants of these signs on the face than did Black signers. They also noted a regional difference within the South. In New Orleans, both Black and White signers produced more signs on the face than did signers in Atlanta. In their study of two-handed signs that can be signed one-handed (e.g., CAT, CHINESE, COW), Woodward and DeSantis (1977) claimed that Black signers produced more two-handed variants of these signs than did White signers. More recently, aspects of Black ASL have been examined by Aramburo (1989), Guggenheim (1993), Lewis, Palmer & Williams (1995) and Lewis (1998). Aramburo and Guggenheim observed lexical variation during the course of structured, formal interviews. Lewis *et al.* studied the existence of Black ASL and attitudes toward it. They described the increases in body movement, mouth movement and the larger use of space in the signing of one Black female signer who code-switched from more standard ASL to Black ASL during the course of a monologue. In addition, they explored how sign language interpreters handled the code-switching, that is, what the interpreters said in English when the signer code-switched between Black ASL and more standard ASL. They found that the interpreters produced the shifts in posture and eye gaze that accompany roleshifting in ASL, features not unique to Black

ASL. Lewis (1998) continued the examination of Black signing styles and described parallels between the communication styles of hearing and deaf African Americans. He focused on kinesic and non-verbal features, in particular, body postures and rhythmic patterns that accompanied the production of signs by one Black adult female. He specifically mentioned the lengthening of the movement in signs, the addition of side-to-side head movement and change in body posture.

Differences between Black and White signing were also examined in the largescale by Lucas *et al.* (2001) discussed earlier and in greater detail in the Louisiana data from the same study (Bayley & Lucas, *in press*). They found variation between Black and White signers in the responses to a vocabulary elicitation task: for twenty-eight of thirty-four stimuli, the Black signers used signs that the White signers did not. However, signer ethnicity was found to be significant with only one of the three phonological variables produced during free conversation, with the class of signs exemplified by the sign KNOW, usually produced at the forehead but subject to lowering. Black participants in the study favored the nonlowered citation form of these signs (the form of the sign appearing in dictionaries and taught in sign language classes). It may simply be that ethnic variation does not manifest itself in the phonological variables selected for detailed study, but the explanation may also have to do with methodological issues and with perceptions of and attitudes toward the users themselves, independent of linguistic units.

As can be seen, much of the prior work on Black ASL was undertaken almost thirty years ago. A current study being undertaken by the authors of this chapter in collaboration with Carolyn McCaskill is collecting free conversation, interview and lexical elicitation data at six sites in the southern United

States, sites chosen according to when the schools for Black deaf children were founded: Raleigh, North Carolina (1869), Little Rock, Arkansas (1887), Houston, Texas (1887), Talladega, Alabama (1892), Hampton, Virginia (1909) and Baton Rouge, Louisiana (1938). Signers in two distinct age groups—"over 55," people educated during the time of segregation and "under 35," people who went to school in integrated settings—are being filmed in free conversations and interviews, the goals being a re-examination of earlier claims about the structure of Black ASL and a more comprehensive description of this variety.

7 CONCLUSION

In the past decade, we have made considerable progress in understanding variation in ASL and other sign languages. However, a great deal of work remains to be done. Here we offer suggestions for what we see as some of the most critical areas. First, although the work reported in Lucas *et al.* (2001) covered seven different cities in the United States, as is true of any early study, it did not examine any particular city or region in the depth that is customary in studies of variation in spoken languages. Much more can be done to understand in detail the patterns of variation even in the areas that Lucas *et al.* examined, to say nothing of the many regions that could not be covered in a single study. Second, Lucas *et al.* examined four variables, the three phonological variables discussed in this chapter, and null pronoun use in narratives, as well as lexical variation. However, many other variable features obviously merit our attention. Hoopes's (1998) small-scale study of pinkie extension suggests one such variable, while Mulrooney's (2002) study of variation in fingerspelling suggests another candidate. Third, changes in the demographics of the Deaf population merit our

attention. As is the case with the United States generally, the Deaf population is affected by increasing levels of immigration. Indeed, Latino children are among the fastest-growing segments of the school-age Deaf population (Gerner de García 1995). Immigrants bring with them a variety of sign languages, many of which are mutually unintelligible with ASL. Clearly we can expect contact between ASL and other sign languages to affect patterns of variation, and perhaps to lead to new dialect formation. Although research has begun in this area (Quinto-Pozos 2002, 2007, 2008), contact among sign languages in immigrant communities presents many more opportunities for research. Fourth, changes in the education of Deaf children may be expected to affect variation in ASL. As we have seen, for many years state schools for the Deaf served

as crucibles of Deaf culture and as a standardizing influence on ASL. However, in the United States, Deaf children are increasingly placed in public schools where there are no more than a few Deaf children (Ramsey 1997). The effects of the decline in enrollment in state schools for the Deaf remain to be seen, but clearly it is a subject for investigation, including the effect on variation in ASL.

We have outlined only a few of the areas where research in sociolinguistic variation in ASL would be most productive. Doubtless there are other areas of equal or even greater potential interest. Research in the sociolinguistics of ASL and other sign languages will, we suggest, provide important insights that may benefit linguistics generally and at the same time provide useful information for the Deaf community.

Variation: Basic Concepts

CEIL LUCAS, ROBERT BAYLEY, AND CLAYTON VALLI

Variation refers to alternative ways of signing or saying the same thing. As we mentioned at the beginning of this book, “sofa,” “couch,” and “davenport” are three different ways of referring to the same piece of furniture in spoken English, while “soda,” “pop,” and “soft drink” are various ways of referring to the same beverage. As we also mentioned, there are many different signs for HALLOWEEN and BIRTHDAY. Linguistic *variables* are alternatives for signing or saying the same thing. These alternatives may correlate with the social characteristics of the signer or speaker, in which case we talk about *socio-linguistic* variables. For example, signers from ASL-signing families often prefer the form of the verb KNOW that is produced on the forehead, whereas signers from nonsigning families often prefer the form that is produced below the forehead or even near the mouth.

We see variation in all parts of the language. In what we call **phonological variation**, the variation that affects the basic parts of signs, units can be changed, added, removed, or rearranged. In terms of change, the individual parts of signs can be variable: The **handshape** of FUNNY and BORED may or may not have the thumb extended, while YESTERDAY and WONDER may be signed with the pinky extended. **Location** may also vary, so KNOW, for example, may be signed on the forehead or further down on the check;

WEEK may be signed with the **palm orientation** down or up. Some forms of a sign such as HELP may have **internal movement** that other forms of the sign do not. And since signers have two hands available to them, we can expect variation in the **number of hands** used in a sign. Some two-handed signs such as DEER may be signed with only one hand while others such as RIGHT may substitute a table or the signer’s knee for the second hand. Other signs such as DIE were originally signed with one hand and have become two handed.

You will recall that signs are composed of sequences of movements and holds. Each movement or hold is known as a segment, and **segments can be added or left out** in the course of signing. For example, GOOD consists of a hold, a movement, and a hold; IDEA consists of a movement and a hold. In the phrase GOOD IDEA, the last hold of GOOD is deleted, that is, it disappears. Likewise, one form of FATHER is a hold with internal movement—the fingers wiggle; one form of STUDY is also a hold with internal movement. But in the phrase FATHER STUDY, a movement is added between the two holds. This addition is called movement **epenthesis**.

Sometimes a combination of a movement and a hold may be deleted in what resembles the **syllable deletion** that occurs in spoken languages. An older form of SNOW, for example, consists of WHITE followed by

Source. Reprinted by permission of the publisher, from C. Lucas, R. Bayley, and C. Valli, *What’s Your Sign for Pizza? An Introduction to Variation in American Sign Language* (2003): 17–22. Washington, DC: Gallaudet University Press.

wiggling fingers, representing falling snow. It is common now to see only the second part of the sign. Likewise, an older form of DOG consists of the hand slapping the upper thigh, followed by the middle finger rubbing the thumb, palm up. Again, this second part of the sign frequently occurs by itself.

The parts of signs can also be **rearranged**. For example, DEAF consists of a hold at the ear, a movement downward, and then a hold on the lower cheek. However, it is common for the first hold to be at the lower cheek and for the sign to move up and end at the ear. This rearrangement of the location is called **metathesis** and is similar to what users of spoken languages do when they say “hunderd” instead of “hundred.” It is interesting to note that not all signs allow the kind of rearrangement that can occur in DEAF, where the positions of the two holds are reversed. Rather, this kind of rearrangement seems to be acceptable for signs made on a horizontal plane, such as FLOWER, RESTAURANT, and HONEYMOON, but other signs like DEAF, such as INDIAN and YESTERDAY, allow movement only up but not down. Interestingly, these signs are produced on a vertical plane.

In addition to variation in parts of segments, segments, and combinations of segments, we also see variation in word-sized units, that is, where the variation affects the whole sign. This is what we see in **lexical variation**. We mentioned the many different signs for HALLOWEEN and BIRTHDAY, and in most cases we are talking about signs that are completely different from each other. For example, the sign for BIRTHDAY in which the ear is tugged does not share anything except meaning with the sign for BIRTHDAY that is a compound of the signs BIRTH and DAY; the sign for HALLOWEEN that has two V handshapes over the eyes is completely different from the one in which the middle finger of the active hand thumps the back of the base

hand. Later on we will compare this to several signs for BANANA that share the same location, palm orientation, and base hand and differ only in the handshape of the active hand.

Variation in word-sized units also occurs at the level of sentences. ASL is known as a “pro-drop” language (like Chinese, Italian, and Spanish); that is, the verb in a sentence may be accompanied by a pronoun, but the pronoun may also be left out. Here is an example: The sentence PRO.1 THINK, meaning “I think,” can also be signed simply THINK, with no pronoun.* This is an example of **syntactic variation**.

Most of the types of variation we have described so far may occur within the signing of individuals. To be sure, people may have a preferred sign for BIRTHDAY, for example, and always use that sign, just as some speakers of English may always refer to a particular piece of furniture as a “davenport,” whereas others may always refer to it as a “couch” or a “sofa.” Other people may use a variety of signs for a single concept such as BIRTHDAY, depending on the situation and the person to whom they are talking. The signing of most people, however, varies at the phonological and syntactic levels. For example, even people who usually sign DEAF from the ear to the chin will occasionally use the chin-to-ear form. Most people who usually use the standard dictionary form of signs made with a 1 handshape will sometimes use an L handshape or a 5 handshape for a pronoun. Even people who seldom use the standard dictionary forms will sometimes use the ear-to-chin form of DEAF and the 1 handshape form of a personal pronoun such as “I.” Thus, when we study variation in ASL or any other language, we are not looking at

* PRO.1 refers to the first-person pronoun “I.” Similarly, PRO.2 refers to the second-person pronoun “you,” and PRO.3 refers to the third-person pronouns “he,” “she,” “it,” or “they.”

categorical differences in the language that different people or groups of people use. That is, we are not saying that some people always sign one way and others always sign another way. Rather, what we are interested in is discovering what kind of people (for example, middle-aged white women who live in Kansas) usually sign one way, whereas other people (for example, young African American men in California) usually choose a different version of the same sign.

Finally, as linguists our orientation is **descriptive** rather than **prescriptive**. That is, our job is to describe the way that people actually sign rather than prescribe how people should sign. When we say that people in one region use the standard dictionary form of a sign more often than people in another region, we are not implying that the signing of people who use the standard form (for example, the ear-to-chin form of DEAF) more often is any better than the signing of people who use a different form (for example, the chin-to-ear form of DEAF). Rather, in the case of ASL, as with all languages, the decision as to what constitutes ASL, or “good” ASL, belongs to those to whom the language belongs—the diverse members of the North American Deaf community.

How Do We Explain the Variation?

We have described some examples of variation in ASL—for example, the sign DEAF, which can be signed from ear to chin or from chin to ear, the sign KNOW, which can be signed at the forehead or on the cheek, and the sign YESTERDAY, in which the pinky can be extended or not. Linguists try to figure out what accounts for or explains the variation. Is there something about the sign immediately before or immediately after it that contributes to the variation? Is there something about the signer—where he is from, his family background—that helps ex-

plain the variation? The characteristics of the context in which the sign is used and the social background of the signer that may help explain the variation are known as **constraints**. There are two kinds of constraints. **Linguistic constraints**, also known as internal constraints, are ones that have to do specifically with language structure. The sign—or parts of it—that occurs immediately before or immediately after the variable sign may be a constraint; the grammatical function of the variable itself may be a constraint—that is, whether the sign is a noun, a verb, or an adjective. The type of discourse in which the variable occurs—for example, a conversation, a story, or a lecture—may play a role, and whether the sign receives stronger emphasis than other signs may also influence a signer’s choice of one form over another. **Social constraints**, also known as external constraints, are social characteristics such as region, gender, age, ethnicity, and socioeconomic class that correlate with the variation. For example, women may use a variant more often than men do, or older signers may use a variant less often than younger signers do. There may be differences between African American signing and Caucasian signing. Moreover, certain social factors such as a signer’s language background are of particular importance in understanding variation in sign languages. That is, does a signer come from a signing, ASL background or from a hearing, non-signing background? Whether a signer is Deaf-Blind or sighted may also be a factor.

Variation, then, is subject to many influences found in the linguistic environment (for example, the handshapes of the preceding and following signs), the occasion on which the sign is used (a conversation among close friends or a response to a question during a job interview), and the personal characteristics of the signer. Also, all of these influences are at work at the same

time. That is, it is very difficult, for example, to disentangle the social characteristics of the signer. A young female African American signer from a Deaf family in New Orleans is *always* young and female and African American and from a Deaf family in New Orleans. All of these characteristics—or only some of them—might influence her choice of one form of a sign or another. For this reason linguists who study variation use complicated statistical software to sort out the extent to which the different characteristics of the signer influence that person's choice among different versions of the same sign and to evaluate the relative importance of those characteristics. In this way we are able to discover the degree to which the variation is systematic, that is, predictable from the context in which a sign is used and from the social characteristics of the signer. We are also able to make statements about the relative importance of the various influences on a signer's choices.

WHY IS VARIATION IMPORTANT?

All natural languages exhibit variation. By describing the patterned, rule-governed variation in sign languages, we can see that they are real languages. Although earlier generations of American Deaf people sometimes accepted and internalized the negative attitudes of the mainstream society about sign language, Deaf people now are proud to recognize ASL as a language like any other, and part of what makes ASL a real language is the presence of variation. The description of variation also helps us to see whether there are any **modality** differences, that is, whether the variation in sign languages differs in any way from that in spoken languages. Also, languages change naturally over time, and variation is usually the first step in the direction of change. By studying variation we can begin to understand how languages change.

Discourse Analysis

MELANIE METZGER AND BEN BAHAN

Everyone knows that when individuals in the presence of others respond to events, their glances, looks, and postural shifts carry all kinds of implication and meaning. When in these settings words are spoken, then tone of voice, manner of uptake, restarts, and the variously positioned pauses similarly qualify. As does manner of listening. Every adult is wonderfully accomplished in producing all of these effects, and wonderfully perceptive in catching their significance when performed by accessible others. Everywhere and constantly this gestural resource is employed, yet rarely itself is systematically examined. In retelling events — an activity which occupies much of our speaking time — we are forced to sketch in these shadings a little, rendering a few movements and tones into words to do so. In addition to this folk transcription, we can employ discourse theatics, vivifying the replay with caricaturized reenactments. In both cases, we can rely on our audience to take the part for the whole and cooperatively catch our meaning. Thus, in talk about how individuals acted or will act, we can get by with a small repertoire of allusions and simulations. Fiction writers and stage performers extend these everyday capacities, carrying the ability to reinvoke beyond that possessed by the rest of us.

Erving Goffman (1981: 1–2)

This phase of sign language behavior is of fundamental importance, and to the writers' knowledge has never been mentioned in the literature about American Sign Language.

Source. Reprinted with the permission of Cambridge University Press, from Ceil Lucas, editor, *The Sociolinguistics of Sign Languages* (2001): 112–144. Cambridge: Cambridge University Press. The references for this reading can be found in the original volume.

Many teachers and psychological counselors of the deaf who have been fairly successful in learning to make the signs and to fingerspell and read the signing and spelling of deaf pupils and clients, have formed the impression that deaf persons are unresponsive, overly dependent, or lacking in self-reliance. What produced this impression seems to be a number of experiences of this kind: the teacher or counselor asks a question or gives a direction and gets no response but a watchful waiting attitude, often interpreted as the expectation of prompting or of help. But what has really happened in the linguistic situation is that the teacher's or counselor's utterance, correct enough in sign production and order, was followed by the kind of juncture that signals the end of a statement. The watcher is not unresponsive; on the contrary, he is responding perfectly correctly, waiting for the next utterance to follow, which the signer's "out of awareness" signal has told him is coming. When, however, the teacher or counselor holds his [or her] hands fixed in the last position reached in the sig of the ultimate sign or moves them toward the class or client still fixed in the dez configuration, he finds that his question has been perceived as a question and a signed answer or other appropriate answer is the response.

Stokoe et al. (1965: 275–6)

Discourse analysis is an interdisciplinary field of social inquiry that has recently come into its own right. For many years, scholars from a variety of fields including sociology,

psychology, anthropology, and cognitive science have pursued the study of human behavior in an effort to understand the patterns and rules that result in communicative interaction. Thanks to the work of scholars such as Schiffrin (1994) and van Dijk (1997a; 1997b), the diverse concerns these scholars have brought to their studies of discourse have been categorized and examined with the same scientific lens that has focused on discourse itself.

The first issue to be examined regards the definition of the very behavior that is to be studied. What is discourse? As van Dijk (1997a) points out, the term “discourse” has a variety of meanings, as diverse as the reference to a particular conversation or to broader social arenas, as in the phrase “political discourse.” Fortunately, for the linguistic analysis of discourse, the term is at least somewhat constrained. Where linguists generally study language at many levels, from phonology to syntax, analysis of discourse refers to the study of language beyond the level of the grammatical sentence (Stubbs, 1983). In face-to-face interactions, sentences are not marked with capital letters or punctuation marks. One of the tasks of the discourse analyst is to identify the boundaries of units of discourse as it occurs when two or more people communicate. Another task is to determine what “grammatical” rules operate on the joining of these units into a coherent discourse, much like syntacticians study the rules by which grammatical sentences are formed. Discourse analysis distinguishes itself by focusing on language as it is used in real-world situations, regardless of whether the emphasis is on the structure of the discourse and the rules which constrain its construction, the actions accomplished through those constructions, or the contextual information that allows it to be both constructed and understood.

DISCOURSE STRUCTURE

Discourse can be examined in light of the rules that govern its organization. This organization can be analyzed regardless of whether the discourse is spoken, written or signed. The structural organization of discourse can be analyzed whether the discourse is monologic (as in lectures and narratives) or dialogic (as in conversations and interviews). The rules that operate on a given discourse can be studied based on whether the discourse is being jointly negotiated (as in face-to-face communication or in computerized chat rooms) or if it is less interactive (as in the pre-taping of a televised speech or the writing of a book).

Examination of the organization of discourse begins with the delineation of units of analysis, or discourse units. According to Schiffrin (1994), unlike the hierarchically structured phonological, morphological and syntactic units to which linguists are accustomed, discourse units do not clearly fit the notion of hierarchies. Discourse units have been described as being as large as entire encounters (see, for example, Schegloff, 1972; Schegloff and Sacks, 1973; Goffman, 1974). They have also been described as being as small as a single turn in conversation (Sacks et al., 1974). Structural analyses of discourse can focus on propositions, reference and cohesion, topic and sub-topic organization, and even style issues. Regardless of the size of the unit of analysis, it is ultimately the examination of an utterance and its relationship to other utterances or types of utterances surrounding it that allow analysts to examine discourse structure.

DISCOURSE ACTION AND INTERACTION

Discourse can also be studied in terms of the impact it has on people and events. Through the use of a variety of linguistic tools, con-

versants are able to enact or comment upon real-world events. Language can affect social relationships at a macro-level. For example, an utterance such as “I hereby pronounce you husband and wife” is a linguistic behavior that changes social relationships for people from a variety of religious backgrounds. Language also affects interaction at the micro-level. For example, as Tannen (1986) points out, differences in conversational style can cause miscommunication and frustration between friends and family members.

When examining the acts conveyed through language, it can be seen that a single utterance can fulfill a variety of functions, including (but not limited to) requesting information, promising, or asserting. A single utterance can simultaneously fulfill more than one function. For example, uttering “Would you shut the door, please?” is both a question and a request. Likewise, a single function can be conveyed through more than one utterance. By focusing on function, it is possible to gain information about sequential structure mentioned above. For example, if one were heard to utter “Would you shut the door please? It’s so cold in here!” then the assertion can be seen in relationship to the request, i.e. as an explanation for it (van Dijk, 1997a: 14).

Acts conveyed by discourse can be direct or indirect. The request to close a door can be as direct as “Please shut the door” or as indirect as “Hmm, the door is open again . . .” People use their knowledge of communication to respond appropriately (or inappropriately), with gravity or with humor. Whether or not an utterance conveys a certain intent can be subjective. A speaker might intend to insult an addressee but fails if the addressee does not feel insulted. Conversely, an addressee might feel insulted by an utterance, even though an insult is totally unintended by a speaker. In order to analyze

how a particular utterance functions, one could analyze at least four aspects of the utterance:

- what happens just prior to the utterance and what a speaker or signer thinks is true about the addressee’s thoughts and abilities;
- what the speaker/signer is thinking or intending;
- what is required in a given language for an utterance to be recognized functionally; and
- what is true about the world as put forth within the utterance.

This is one way of approaching the analysis of what conditions make utterances work between interlocutors. Discourse analysts can study the acts that are explicitly and implicitly conveyed by discourse, and the underlying rules that people bring to the uttering and interpretation of them.

Just as language provides a source for accomplishing certain acts, it is also a primary link allowing people to come together and interact with one another. Language is the behavior through which people communicate, and to do so they must have ways of beginning conversations (and ending them), initiating, maintaining and yielding turns, introducing or shifting topics, being polite (or rude) and, generally, conveying any of the myriad of acts alluded to above (such as insulting, requesting, agreeing, arguing, persuading, etc.). Analysts of discourse also study the ways in which people accomplish these aspects of interaction. If it is possible for a speaker or signer and an addressee to have different feelings about whether or not the addressee has been insulted, then interaction requires some cooperative effort focused on constructing and deconstructing the ideas and thoughts that are intended. That is, conversational partners work together to jointly negotiate their interactions.

This is true regardless of whether the interaction is a casual conversation, an interview for a job or with a medical doctor, or a formal presentation in which the presence or absence of audience laughter and back-channeling causes the presenter to make adjustments to the style and content of the presentation.

CONTEXT AND DISCOURSE

Unlike the objective principles and laws that govern the physical environment, human interaction is variable. In order to truly understand the structure of discourse, and the social factors that impact upon it, it is necessary to examine the context in which the discourse occurs. Yet, as van Dijk (1997b) points out, context is as difficult a construct to define as is discourse. Nevertheless, there seems to be sonic agreement that, in addition to the information provided by the sequential unfolding of utterances, context incorporates at least three factors. The physical environment includes not only the location in which the interaction is taking place (such as a doctor's office) but also the objects or props and actions that are happening there. A second contextual factor is the background knowledge that participants bring to the interaction. This background knowledge is the information about the world and how people are expected to behave in it. This knowledge has been acquired through natural interaction and through books and other media throughout a participant's lifetime. Finally, the social relationships and the situation in which the interaction takes place represent a third factor providing contextual clues that allow interlocutors to understand and interpret the meaning of the discourse as it unfolds. These factors work together to assist people in producing and interpreting utterances. For example, the response to the greeting below will likely vary,

depending on whether it is uttered by a medical doctor in a doctor's office, or by a business associate in the hallway:

- A: How are you doing?
B: Fine! How are you?
A: How are you doing?
B: Well, I still have a fever . . . my medicine doesn't seem to be working.

The different interpretations are based on the location of the interaction (conversations are usually short and quick in a hallway vs. a medical office), the background knowledge of participants (that doctors take medical histories and business associates use such statements as greetings) and social context (doctors are responsible for taking care of ailments, while business associates might not be so interested in such personal information). Recognition that context incorporates aspects of the physical environment, background knowledge of participants and social relationship of interlocutors provides an objective framework from which to analyze discourse.

Context is relevant to the analysis of discourse structure because it is through the use of particular expressions and utterances within specific contexts that people can convey and comprehend what is being communicated. The sequential structure of a particular discourse can be seen in terms of the relationship of utterances to the context within which they occur. It is relevant to the functions conveyed by discourse because the social actors, their relationships to one another, their background knowledge and the situation in which they communicate can all impact upon the effect of what is uttered. The utterance "I hereby pronounce you husband and wife" carries a specific function when uttered at a wedding by a preacher or justice of the peace. It cannot carry the same function when uttered in any

other circumstance or by any other type of social actor.

METHODOLOGICAL APPROACHES TO DISCOURSE ANALYSIS

The notion of language as social interaction serves as the basis for the analysis of discourse above the sentence. Nevertheless, there are a variety of theoretical perspectives and methodological approaches that have been applied to the study of discourse. According to Schiffrin (1994), there are six approaches, each influenced by the theories and disciplines that originally motivated them. The six approaches that Schiffrin describes extensively are: speech act theory, interactional sociolinguistics, ethnography of communication, pragmatics, conversation analysis and variation analysis. These approaches have been applied to the study of sign language discourse, and so it is worth summarizing her description of them here.

Speech Act Theory

Speech act theory can be directly attributed to two philosophers, John Austin (1962) and John Searle (1962; 1969). In the mid-1950s, when Austin first discussed the principles of speech act theory, the prevailing philosophical thought about language was to analyze its truth value based on a formal system of logic. Austin, however, noticed that some utterances do not have a truth value, but are intended to accomplish certain functions. For example, to declare “I hereby name this ship the SS Linguistics” allows the smashing of a bottle against the bows of a ship to have meaning. Verbs within an utterance that actually state, or *perform*, the action to take place in particular circumstances are *performatives*. For example, a ship is *named* when the appropriate person says it is named, so the act of naming is performed by the uttering of the verb.

Austin divides speech acts into three parts: locutionary, illocutionary, and perlocutionary. The locutionary act refers to the actual process of producing a sensible utterance. The illocutionary act is the performative act that is being carried out. The perlocutionary act is the effect that the utterance has by having been uttered. These three together make up the speech act of an utterance. Searle applied Austin’s work within linguistic theory and developed a set of rules that he felt are unconsciously learned by users of a language to determine what an utterance is intended to accomplish and whether or not it has been accomplished effectively.

Speech act theory was originated philosophically and developed theoretically. However, despite the fact that the theory does not focus on issues such as multiple speakers and overlaps so common in interactive discourse, its fundamental principles are extremely useful. A single utterance can incorporate more than one speech act. Similarly, a single speech act might involve more than one utterance (or more than one turn in a conversation) (Schiffrin, 1987: 33). The act or actions intended to be undertaken by an utterance may be indirect and veiled. For instance, a speaker might state a request directly as in “Please close the door” or indirectly as in “It sure is cold in here!” Examination of directness and indirectness within utterances can provide useful information about languages and social interaction. For example, Tannen (1986) discusses how conversational style can vary based on factors such as regional background or gender, and can have a tremendous impact on people’s daily lives, even making or breaking personal relationships. Speech act theory provides a systematic approach to analyzing the functions of utterances in discourse.

Despite the use of the term “speech,” speech act theory is not limited to the study

of spoken languages. Native users of sign languages, like those of any language, use language to perform such acts as asking, requesting, offering, threatening, advising, etc. Although very little research directly applies speech act theory to sign language discourse, Celo (1996) applies this theory to Italian Sign Language (LIS) and the use of interrogatives, and Roush (1999) to indirectness in ASL. In his examination of the syntactic and pragmatic aspects of *wh*-questions and *yes-no* questions, Celo finds that there is at least one performative sign in LIS that can be used to indicate interrogative intention for *yes-no* questions. This manual sign is produced with a flat O handshape. This handshape is articulated either in front of the signer or on the back of the other hand (palm downward). There is no translation for this sign in Italian, but Celo suggests it functions much like the upside-down question mark at the beginning of written Spanish questions. In a similar way to the question mark in written Spanish, the interrogative sign is produced at the beginning and end of the signed LIS interrogative.

In his study of requests and refusals, Roush examines speech acts in terms of politeness and conversational style. The application of speech act theory provides a framework for Roush to challenge a stereotype about directness within the American Deaf community. Interestingly, both Celo and Roush find that non-manual signals play an important role in the analysis of illocutionary and perlocutionary force in sign languages.

Interactional Sociolinguistics

While speech act theory offers a philosophical approach to the study of discourse, anthropology and sociology combine with linguistic theory to provide the interdisciplinary background for the approach

Schiffrin (1994) identifies as interactional sociolinguistics. Sociologist Erving Goffman provides the sociological perspective. In his extensive work he focuses on both the ritual and systematic nature of interaction, and how this interacts with specific interactive events. For example, in his work he applies the observations of Bateson (1972) regarding animal interaction to humans. Bateson observes that monkeys are able to engage in what is seemingly identical behavior (such as fighting), but can determine when that behavior is intended as playful or serious. Goffman discusses this ability to frame behavior in human interaction. Linguists then apply his analysis of how interaction is framed and how people frame their relationships to one another through their discourse.

Gumperz contributes an anthropological perspective. Like Goffman, he focuses on both the impact of society and the individual on a given encounter. Gumperz' work examines the ways an individual interprets an interaction. He describes a variety of contextualization cues that can be used as conversational strategies to aid in the interpretation of discourse within a particular interaction; these are based on the specific individuals who are present, and their cultural and subcultural backgrounds.

Because interactional sociolinguistics is focused on interpretations that are unique to a given encounter, the data are based on naturally occurring interactions. These data are recorded and transcribed, as a basis for analysis. A growing body of research on sign languages has applied this theoretical framework, including the work of:

- Mather (1987; 1989; 1990; 1994) regarding adult-child interaction;
- Mather (1991) as applied to tty (teletypewriter, a text telephone device) telephone conversations between deaf interlocutors;

- Winston (1991; 1992; 1993; 1995) as applied to the use of space in ASL monologic discourse; and
- Roy (1989a) and Metzger (1995; 1999) as applied to interpreted discourse.

These studies are addressed later in this chapter.

Ethnography of Communication

Perhaps in keeping with its anthropological foundation, the ethnography of communication is one of the broader approaches to discourse. According to Schiffrin (1994: 137)

Not only does it focus upon a wider range of communicative behaviors than the other approaches, but built into its theory and methodology is an intentional openness to discovery of the variety of forms and functions available for communication, and to the way such forms and functions are part of different ways of life.

Developed by Dell Hymes (1972), the ethnography of communication includes both the notion of speech acts and the role of macro-level social, specifically cultural, experience in communication. Hymes refers to the knowledge that an individual brings to interaction regarding language use and structure as his or her “communicative competence.” This communicative competence focuses on the ability to communicate in the situations of daily life. He contextualizes speech acts by associating them, in a given analysis, with the situation and event in which they occur. Data are collected via the ethnographic participant observation engaged in by anthropologists, and analysis is focused specifically by a set of issues identified as relevant by Hymes (1972) in his SPEAKING grid:

| | |
|---|---|
| S | setting/scene |
| P | participants |
| E | ends |
| A | act sequence |
| K | key |
| I | instrumentalities |
| N | norms of interaction and interpretation |
| G | genre |

This taxonomy assists in the analysis of the three units that Hymes deems essential:

- the speech situation, e.g. a medical encounter;
- the speech event, e.g. the medical history interview; and
- the speech act, e.g. a question.

By utilizing Hymes' taxonomy, analysis of discourse ethnographically yields a completely different perspective than other approaches to the analysis of discourse. This is because the ethnography of communication takes into account the participants in the interaction, their goals and the setting in which the discourse takes place.

The ethnography of communication as an approach to the study of signed discourse has been applied in a variety of studies, such as Erting (1982; 1994) and Ramsey (1997) in their examinations of the educational experiences of deaf children. Erting (1982; 1994) and Johnson and Erting (1989) examine the role of social identity in the interaction of deaf and hearing adults and children in a preschool for deaf children. The ethnographic approach to this research results in the recognition that, for at least some deaf people, their sense of identity is comparable to that of many ethnic groups, and that this sense of identity is the natural outcome of the use of a visual language in a visually-oriented cultural environment. This realization is found to have implications when hearing, non-native signers of ASL attempt simultaneously to sign and speak (or to use

sign-supported speech, SSS) and end up producing a visually-incomplete or inaccurate utterance when comparing the signed portion of the utterance to the spoken one. This clearly has ramifications for the training and assessment of preschool teachers.

Ramsey (1997) finds, through her year long ethnographic study, that the public school mainstream class she examines does not provide the deaf children with an educational experience that is equitable to that provided to the hearing students. Interestingly, her findings indicate that this inequity is neither the result of malice nor apathy. That is, it is in spite of very good intentions (or, perhaps, because of them?) that the students receive an educational experience that is less than that of their hearing peers. Her study emphasizes the importance of focusing on the goals of education and development for deaf children as the priority within their classrooms.

Pragmatics

Pragmatics as a subfield within linguistics is so broad that it very nearly defies definition (Levinson, 1983). Generally, pragmatics distinguishes the meaning of utterances in interaction from their literal and conventional semantic meanings. Specifically, Schiffrin (1994) identifies Gricean pragmatics as a describable pragmatic approach to the analysis of discourse. H.P. Grice (1957; 1968; 1975) is attributed with two major contributions to the field of pragmatics. First, he analyzed “speaker meaning” (as opposed to “semantic meaning”) and, therefore, raised the issue that an utterance can be made with a certain intent that could differ from the seemingly obvious conventional sense of the words. Second, he developed a description of the “Cooperative Principle” to account for the ways in which conversants take advantage of

the expectation of conversational cooperation in order to try to satisfy their interactive goals. The cooperative principle essentially consists of four maxims regarding the quality, quantity, relevance and manner of utterances in a conversation. That is, conversational partners can generally be expected to share information, in a polite manner that is factually correct, relevant and sufficient for the addressee’s knowledge. Because of the underlying expectation for cooperation, conversationalists can flout the maxims. For example, if a child is concerned about his or her parents’ reaction to a bad grade at school, he or she might respond as follows:

Mother: So, did you get your exam back today?
How did you do?

Child: Oh, no, we didn’t get our grades back this afternoon.

In this example, the child’s utterance flouts only one of the four maxims in the Cooperative Principle: the maxim of quantity. His response is polite, relevant to the question, and factually correct, but does not include sufficient information for his mother: the exams were returned in the morning, not the afternoon. The child takes advantage of the expectation that what he says is enough information in order to conclude answers to the mother’s requests for information. Any of the maxims of the cooperative principle can be flouted, and examples of it abound in many arenas, particularly in humor and advertising. Analysis of conversation provides insights into why people infer what an utterance—or a sequence of utterances—means.

Perhaps because of its roots in philosophy, Gricean pragmatics accepts constructed sentences in imagined real-world contexts as data. However, Schiffrin (1994) suggests that to apply Gricean pragmatics to the study of discourse, it is necessary to apply

it to utterances from real-world interactions. In fact, in her own sample analysis, she focuses on the questions Grice addresses regarding how people infer meaning by analyzing referring sequences within a spoken English narrative. She suggests that the application of Gricean pragmatics to the analysis of discourse helps in the examination of how addressees use discourse to infer what a speaker means. While listening to a pronoun in English, an addressee might depend on the maxim of relevance to infer the identity of the intended referent.

Although the number of analyses of pragmatics in sign language discourse is somewhat limited, there have been studies that incorporate issues related to Gricean pragmatics. For example, Johnson (1994) and Paine and Johnson (in preparation) examine the role of first-time and second-time fingerspelled words in ASL discourse. This builds on Schiffrin's (1994) analysis of referring terms, and on the relevance of explicit vs. inexplicit reference. Johnson (1994) and Patrie and Johnson (in preparation) find that signers are often more explicit or clear in the articulation of first-time fingerspelled words. Since the phonological production of a fingerspelled word can convey a more or less explicit referring term, an addressee can use that information to assist him or her in interpreting the signer's intended meaning. That is, by recognizing that a fingerspelled word is articulated in a certain way, the addressee can identify that referring term as being a first-mention or as referring back to a previously mentioned referent. This kind of observation and analysis is exactly what pragmatic analysis of discourse is intended to uncover.

Roush (1999) examines the role of politeness in directness and indirectness in ASL, supporting Schiffrin's (1994) contention that politeness as referred to in the cooperative principle is culturally defined. Roush finds that ASL signers in conversation

use both manual and non-manual signs to mitigate what might otherwise be construed as direct and even rude utterances. His research counters the previous perception of deaf Americans as being direct and rude. The application of a pragmatic approach to the analysis of a sign language provides useful information about how addressees can infer the intended meaning of a signer. In the two studies described here, it can be seen that two aspects of sign languages that are distinct from spoken language discourse — fingerspelling and non-manual signals — can play an important role in the pragmatics of signed discourse.

Conversation Analysis

Harold Garfinkel's ethnomethodology (1967; 1974) provides the sociological foundation for the work of conversation analysts such as Sacks, Schegloff, and Jefferson. Like some other approaches to the study of discourse, conversation analysis is concerned with both the structure of interaction and the knowledge that participants bring to it in order to communicate and understand one another effectively. However, conversation analysis is much more focused on the structural sequences within conversation. For example, the locus of analysis is on the description of events within a conversation, such as the opening up of the last phase of a conversation. In this sense, conversation analysis is less likely than other approaches to dwell on the competence of the participants. The focus is more on structural aspects of the conversation (which in turn reflect participants' knowledge and linguistic competence).

Schegloff (1972) and Schegloff and Sacks (1973) note that one event common in conversational discourse is the use of an utterance which requires a second part or a response of some sort to fill a next-position

slot. Such “adjacency pairs” account for numerous aspects of interaction, including the manner in which people negotiate the beginning or ending of a conversation. One form of adjacency pair is the “summons–answer” sequence found in spoken telephone conversations (Schegloff, 1972). Adjacency pairs are found in greetings and also in conversational closings (Schegloff and Sacks, 1973). They provide evidence of the relationship between context and language use. That is, it is possible for contextual events, such as the flashing light of a telephone tty ringing, to provide the first part of a summons–answer sequence. In spoken language studies, this accounts for the seemingly three-part greeting exchange found in telephone conversations:

“Hello?”

“Hi! This is Dawson. How are you?”

“Oh, hi. I was just thinking about you!”

Adjacency pairs can also be used to negotiate the turn exchanges within a conversation. This happens explicitly to signal turn exchanges within a tty conversation, through the use of typed GA (Go ahead).

Recorded conversations and a transcription system are used to capture a conversation and to describe it in a manner that is unbiased about what is relevant. For example, pauses, inbreaths, etc. would all be transcribed by a spoken language conversation analyst. Although there is no conventional transcription system in place for the analysis of sign language following this approach, features that have been included in transcription include head and body movement, eye gaze, facial expression, spatial location of articulators (see Winston, 1993) and even gestures that are not linguistic *per se*, but are part of the gestured communication common to most languages, be they spoken or signed (see Liddell and Metzger, 1998). To gain insights into the relevant structural features, there is

generally a preference toward analysis of a larger corpus of data.

This approach to the analysis of discourse can be found in a variety of sign language studies. For example, Dively (1998) applies the work of Schegloff et al. (1977) on conversational repair to the repairs in an ASL interview. Glaser (1999) examines the interaction of the constraints of written text and natural conversational features in tty conversations of an adult member of the British Deaf community. These two studies are discussed later in this chapter.

Variation Analysis

The study of linguistic variation (i.e., alternate ways of saying the same thing) was developed by William Labov. Grounded in linguistics, variation analysis seeks to locate units of discourse that share a meaning, and to determine what social or linguistic factors contribute to the existence of multiple variants. Variation analysis can apply to units of discourse ranging in size from the smallest unit of contrast produced phonetically to entire segments, such as the narrative, which generally occurs within the larger context of interaction. In order to determine the environments in which certain variants occur, it is useful to gather a fairly large corpus of data and conduct quantitative analyses. In addition, when searching for social factors responsible for the variation, it is essential that the data include representation of these factors. That is, the data would include both male and female subjects when examining gender variation.

Lucas (1995) examines the ASL sign DEAF, and the phonological variation of location (chin-to-ear vs. ear-to-chin). She finds that the phonological variation is patterned in terms of the sign and its distribution in discourse (e.g. syntactically). Hoopes et al. (2001) focus on three different studies,

including lexical variation, phonological variation and variation between visual and Tactile ASL. In what is likely the largest study of sociolinguistic variation in a sign language, Lucas et al. (2001) report on phonological, lexical, morphological and syntactic variation in ASL, based on videotaped conversations between native signers from seven locations in the USA, from three different age groups, including both white and African American signers.

FEATURES OF SIGN LANGUAGE DISCOURSE

There are many approaches to and motivations for the analysis of discourse, be it spoken, written or signed. Some research examines situated discourse with a focus on contexts and participants, and on their goals and how they use language to achieve them. Other studies focus on larger patterns of discourse that are identifiable within a particular genre of discourse (such as conversation or narrative) or on a particular language (such as a study of the role of eye gaze in Filipino Sign Language). Still others seek to find universal features of discourse that appear to be common for all languages, such as turntaking in conversational interaction.

Regardless of the motivation, theoretical framework, analytic approach or specific sign language being analyzed, the following sections describe features that researchers have found in their analyses of sign language discourse. The narrative in Figure 5.1 is used to provide examples of these features. This narrative is taken from a multiparty conversation including five deaf native signers of ASL between the ages of 25 and 55 from the American mid-west. The data are used with permission and taken from the study of Sociolinguistic Variation in ASL, conducted by Lucas et al. that has been supported in part by a grant from the National Science Foundation. Transcription is based

on that used in the Vista ASL Series Transcription Convention (in Lentz et al., 1988) with a translation into English provided in italics below each line of the narrative. The narrative occurs in the midst of a conversation about the bombing of a federal building in Oklahoma, and focuses on the signer's experience with the moment of silence that was held in respect for the many victims who were killed in that bombing. The narrative begins with the signer explaining that the moment of silence took place a week after the bombing, during a class he was teaching in an interpreter education program.

In this narrative, the signer begins his turn in the middle of the discussion about the bombing event. He takes only about 35 seconds to tell about his experience, but he includes many discourse-level features. The features that will be highlighted and discussed below include:

- the getting, maintenance and yielding of turns (turntaking);
- the occurrence of false starts and repairs within conversation (conversational repair);
- the use of discourse markers to provide information about what has been said or what is coming up next in the discourse (discourse markers);
- the acting out and “speaking for” others when describing events from other times and places (constructing dialogue and action);
- the ways in which people use discourse to coordinate what they say and make it more coherent (cohesion); and
- some of the strategies that are used to involve addressees more intently in what is being uttered (rhythm, rhyme and repetition).

Turntaking

One of the earliest studies of interactive sign language discourse focused on how deaf

AWFUL! PRO-1 THINK

That reminds me of something awful

POSS-1 CLASS IX-loc

that happened in a class of mine.

PRO-1 TEACH INTERPRET TRAIN PROGRAM IX-loc

I teach in an interpreter training program

HAVE TWO STUDENT FROM O-K-A C-I-T-Y IX-loc

and I have two students who are from Oklahoma City.

THAT EXACT ONE WEEK—BOMB ONE WEEK LATER (head nod)

That week—a week after the bombing

ANNOUNCE HAVE TIME TIME-NINE-O'CLOCK IX SILENCE FOR ONE MINUTE. FINE.

we were all told that there was time set aside for a moment of silence, at nine o'clock. Okay . . .

DURING POSS-1 CLASS TIME EIGHT-T-(O) TEN. FINE.

That happened to be during the time I was teaching, since my class met from 8 to 10 o'clock. Okay.

PRO-1—(rs: PRO-3) PRO-3 WANT HONOR. FINE.

I—and they wanted to show respect. Okay.

WELL GET-UP (CL: people standing in semi-circle)

So, everyone stood-up

BE-QUIET. STAND. BE-QUIET . . .

and we were all standing there quietly,

#THEN FEW MINUTE PRO-1 OPEN-EYES THINK ENOUGH TIME. FINISH

then after a few minutes I opened my eyes because I thought it had been enough time and we were done.

PRO-1 CL:9 (eyes look up) (rs: startled) HOLD-IT. SILLY! STUDENT CRY+++

But when I opened my eyes and looked up at the class I was surprised to see someone crying.

LOOK-AT, WOW TOUCH-HEART.

And it really got to me . . .

(rs: IX-loc) FIND POSS-3 SEVERAL FRIENDS DIE PRO-3 (wh)IX-loc TOO

I found out they lost several friends that day.

S-O PRO-3 KNOW SOME PEOPLE IX-loc. WOW LOOK-AT WONDER. TOUCH-HEART WOW

So I had students who actually knew some of the people who died in the bombing. Really made me think!

Fig. 5.1. Narrative from a multiparty conversation including five Deaf native signers of ASL.

Notes: ix – index; loc – location; poss – possessive; pro – pronoun; rs – role shift; cl – classifier; # – lexicalized finger-spelling.

interlocutors get and yield turns (Baker, 1977). In order to examine how turntaking happens in discourse, it is necessary to identify relevant points for turn initiation and how these points are marked in the discourse. It can then be better understood why one person appears to have smoothly interjected a point, and why another person seems to be interrupting someone else's turn. Sacks et al. (1974) found in spoken conversations, a point in conversation they identify as the "turn relevance place." It is at that point in the conversation that a set of rules comes into play, governing the coordination of who gets a turn at talk. Turns can be allocated by a current speaker (and accepted or declined), requested by another speaker (and again, accepted by others or not), or the turn relevance place can be bypassed until the next opportunity arises. The identification of such rules is helpful not only in understanding the local organization of conversation, but also in examining what happens when conversations have "problems. That is, interruptions can be identified on the basis of a speaker "violating the rules and attempting to elicit a turn at a place in the discourse that is not a turn relevance place. It is important to recognize, however, that conversational regulation, like any other aspect of discourse, is subject to sociolinguistic factors. It is possible to find that what one speaker considers to be an interruption may be seen by the "interrupter" to be a sign of rapport and interest (Tannen, 1984).

In the narrative in Figure 5.1, the five interlocutors are having a conversation about the bombing of a federal building in Oklahoma City. At the point that the narrative begins, the conversation has focused on how the experience might differ for surviving bomb victims who were stuck in the rubble, depending on whether they were hearing or deaf. After a comment about whether one would be better off hearing or not hearing rescue teams (especially if they were to come

very close without making it in time), there is a pause in which all signers have their hands at rest. At this point the signer of the narrative raises his hands to begin, and the other conversants accept his turn in the conversation. This pause is an example of a turn relevance place. The signer took advantage of it and successfully took the floor. In research on sign language discourse, one way of taking the floor is to shift from a position in which the hands are at rest. This turntaking strategy and others were originally described in an early study of turntaking in sign language discourse (Baker, 1977). Baker's study of two videotaped, dyadic conversations examines the signaling of turn initiation, maintenance and shift in ASL. Baker discussed her findings in terms of both signer and addressee behaviors, and found that the majority of these regulators are articulated non-manually in ASL. Other studies have found additional features. These are the features that are discussed below:

- hand movements;
- indexing, touching, waving, tapping;
- postural/head shifts;
- use of eye gaze to or away from addressee;
- changes in pace of signing;
- filling pauses (by holding the preceding sign, furrowing brow, looking up, etc.);
- head nodding and facial expressions (such as smiling, expressing surprise, agreement, etc.);
- changing the size and frequency of head nodding;
- use of palm up or indexing addressee;
- shifting to or from hands at rest;
- repetition of signs.

Some of these features are used to elicit turns, others to continue or to shift turns. Some of these are employed by the signer whose turn it is, others by the addressee.

Baker's taxonomy of turn initiation regulators includes optional attention getting

devices, such as indexing, touching or waving of a hand. Even without tactile initiation regulators or visual initiation regulators, Baker (1977) finds that the movement of a signer's arms out of a rest position is sufficient to mark the beginning of a turn, just as the signer did to initiate the telling of his Oklahoma City Bombing experience. The signer might also lean forward toward the addressee, and usually begins the turn without making eye contact, unless asking a question. Not surprisingly, addressee status is marked by eye gaze toward the signer and a lack of signing. This same eye gate behavior has also been found in other sign languages, such as Filipino Sign Language (FSL) (Martinez, 1993; 1995).

The touching strategy in ASL, discussed in more detail by Baer (1991), can include various kinds of tapping. For example, Baer describes tapping on the top of the shoulder as indicating the request for a turn, as opposed to a tap on the side of the shoulder, which is an indication that the "addressee" is blocking the tapper's view. The weight and frequency of taps on the top of the shoulder convey information about the turn requestor's utterance-to-be, for instance, whether it is urgent or exciting information. Mather (1990) also examines attention getting strategies in ASL and distinguishes between what she terms tactile initiation regulators and visual initiation regulators. Mather and, later, FitzPatrick (1993) and Chen (1993), find that an additional strategy, used with young children, is moving into the line of sight of the addressee to elicit his or her attention. Mather finds this is most effective when the turn initiator waits for the child to settle into the eye contact before beginning the utterance. FitzPatrick finds that a combination of visual and tactile initiators seems to be most effective, when engaged in communication with a group of deaf children.

The signers maintain their turns at propositional boundaries or after brief pauses by maintaining a lack of eye contact, keeping their hands in the signing space (with possible fillers such as furrowing the brow or shaking an index finger slightly) or holding the last sign that was articulated while pausing. In addition, the signer might increase the speed of signs within their discourse. During turn maintenance the addressee maintains eye gaze at the signer, and responds through backchanneling, repetition of some of the signed utterance or indexing the signer after propositions.

Signers mark turn relevance places by making eye contact with the addressee (this has also been found in FSL; Martinez, 1993; 1995), slowing down the speed of their utterance near the end of their turn, returning to a rest position, or eliciting a response from the addressee through one of a variety of behaviors. Ways of eliciting a response include raising a palm with the heel of the hand raised up, indexing the addressee, raising or holding the last sign of a turn, or using other non-manual markers for question forms that indicate the expectation of a response. Addressees mark the desire to get a turn by moving the hands out of a rest position (and also possibly by using the attention getting devices previously mentioned), breaking eye contact from the signer (when the signer makes eye contact with the addressee) or interrupting the signer and repeating the beginning of his or her utterance until the signer makes eye contact and relinquishes the turn. In addition, the addressee might increase the frequency and size of head nodding or indexing the signer, or shift his or her palm to a raised position, palm up.

Baker also mentions that in her data, the use of overlap is different from that in spoken language, where overlaps are temporally relatively short. In more recent research, Thibeault (1993) examines the use of overlap

in a videotaped, dyadic conversation in FSL. Thibeault finds that overlap in the FSL conversation occurs frequently, and that it apparently fulfills two functions. One is related to turntaking, as discussed by Baker, in which one participant uses overlap to “interrupt” the signer in successful attempts to initiate a turn. The other, following Tannen (1954), is the use of overlap as a high-involvement style, in which the signers overlap when they share knowledge of the topic. For example, the addressee overlaps with the signer to bypass the fingerspelling of a familiar name.

Conversational Repair

Regardless of conversational style, every interaction is subject to the possibility of errors in need of repair. In fact, Schegloff et al. (1977) propose that repair is not limited to errors and corrections. They posit that repairs also take other forms, such as word searches when a speaker tries to remember someone’s name. In their analysis of the organization of repair in English conversation, Sacks et al. (1974) describe the “repair-initiation opportunity space,” a period of conversation lasting three turns and beginning with a trouble source. It is during this period that the speaker can self-initiate a repair, or that a repair can be initiated by another participant. They find that there is a preference for self-repair and describe in great detail what forms repairs take in their English data, and what options there may be regarding which participant completes an initiated repair. As Brown and Levinson (1987) point out, politeness and cooperation in interaction seem to be universal, although how this is accomplished varies culturally. It is quite likely that the preference for self-correction is an issue of politeness and saving face for the person with the floor.

In the Oklahoma City Bombing narrative in Figure 5.1 above, the signer produces at least one self-correction. At the point at which he is describing the announcement about the moment of silence he signs:

THAT EXACT ONE WEEK—BOMB ONE WEEK LATER
(head nod)

That week—a week after the bombing

This self-correction is an example of what Sacks et al. call a replacement repair, in which the words (or signs) are intended to replace a prior utterance. Examples of replacement repairs, and other types of repairs described by Sacks et al., are documented in an ethnographic interview with three deaf ASL signers (Dively, 1998). In addition to replacement repairs, Dively finds examples of self-initiated repair, self-completed repair, other-initiated repair, other-completed repair and word-search repair. She also finds some repair strategies that appear to be unique to sign language discourse. For example, she finds that lexical signs that are independent, free morphemes produced without the use of the hands (nonhanded signs) can be used for repair. One example of a nonhanded sign (NHS) used for repair is NHS-i-WRONG, which can be produced with a brief head-shake or with the head moving from one side to the other and then back to neutral (p. 142). Dively also finds that space can be a repair issue in ASL. In one example from her data, the signer referred to her mother on the right side of the signing space. Later in her discourse, she replaced the right side with the left side of the signing space to indicate the same referent. Such a replacement could have been made as a result of the hand producing the remainder of utterances, since two hands can sign simultaneously (p. 157). Dively also finds that the signers use eye gaze and head turns to repair their ASL utterances. For example,

Dively finds that eye gaze down and to the right or left of the signer combined with the turning of the head is used as a self-initiated word-search repair while the signer recalls information, such as the specific date of an event under discussion. Finally, the one type of repair that did not occur in Dively's data is other-initiated repair of ungrammatical utterances. Dively suggests that this is due to the fact that the three participants do not know one another very well. She also suggests that other-initiated repairs of grammaticality are more likely to occur in language learning environments. This is supported by research regarding the use of repair strategies as modeled by ASL teachers during ASL classes.

Strategies identified by Smith (1993) and Johnston (1993) include the ways in which the teacher would rephrase a question in order to assist a student in comprehending: For example, the teacher used a *wh*-question, followed by a more specific request which included lexicalized finger-spelling. When the student still did not understand, the teacher shifted to non-lexicalized fingerspelling and finally to a syntactic rephrasing of the original question (to a *yes-no* form). The teacher also used repetition of the students' lexical or finger-spelled utterances as a point of similarity upon which to build mutual understanding (Johnston, 1993). Smith (1993) suggests that, in this way, the teacher is modeling repair as a discourse strategy, based on students' own linguistic competence and for their future benefit as they become more fluent in the language.

Of the repair strategies identified in these studies, the use of "two-layered staff of utterances" is particularly interesting. By two-layered staff of utterances, Dively refers to the ability of signers to articulate more than one morpheme at the same time. That is, a signer can produce two separate one-

handed signs simultaneously, one with the right hand, the other with the left. An example of this can be found in her data, in which one of the signers signs PRO.1 with the right hand while signing WAIT-A-MINUTE-hs-5-body with the left hand (Dively, 1995: 157). More commonly in her study, signers produce a two-handed manual sign concurrent with a nonhanded sign, as when one of the participants in her data signed what she categorizes as a fully lexical nonhanded sign NHS-UNSURE while signing manually DON'T-KNOW (p. 144). Dively calls for more research on the possible use of two-layered staff of utterances in spoken languages, perhaps through the use of spoken utterances combined with gestures such as thumbs up or down.

Discourse Markers

Not surprisingly, the term "discourse markers" refers to units of discourse that mark or bracket segments of talking or signing. Schiffrin (1957) studies discourse markers as they occur in spoken English conversations, where they serve the speakers and addressees in producing and understanding interaction. She finds that discourse markers fulfill a variety of functions related to the exchange structure, the conveyance of actions, and framing the relationship between participants. Discourse markers help to connect sequences of utterances. For example, *and* joins two clauses by linking both prior and upcoming text, and *but* offers contrast between them (see also Tannen, 1993). In this manner, then, Schiffrin suggests that discourse markers coordinate discourse and provide coherence.

Discourse markers are not, however, limited to conversational discourse. For example, the use of *and* and *and then* in English narratives can be to sequence the description of events within the story:

1. **And then** we lived there for five years.
2. **and we bought**—we bought a duplex across the street.
3. **And** by that time we had two kids,
4. **and we moved** on the first floor,
5. **and rented** out the second.

(Schiffrin, 1987: 39)

In the Oklahoma City Bombing narrative, the signer also uses discourse markers to sequence the events that take place within his ASL narrative:

THAT EXACT ONE WEEK—BOMB ONE WEEK LATER
(head nod)

That week—a week after the bombing

ANNOUNCE HAVE TIME TIME-NINE-O'CLOCK IX
SILENCE FOR ONE MINUTE. **FINE**.

we were all told that there was time set aside for a moment of silence, at nine o'clock. Okay . . .

DURING POSS-1 CLASS TIME EIGHT-T-(O) TEN.
FINE.

That happened to be during the time I was teaching, since my class met from 8 to 10 o'clock. Okay.

PRO-1—(rs: PRO-3) PRO-3 WANT HONOR. **FINE**.
I—and they wanted to show respect. Okay.

In his narrative, the signer uses the sign **FINE** (produced with an open five handshape tapping on the signer's chest) to separate the events that lead up to his discovery that he teaches students who knew some of the victims killed in the bombing.

In an analysis of an ASL lecture, Roy (1989b) examines the role of discourse markers that segment the introductory, developmental and closing episodes. Similar to Schiffrin's (1987) findings regarding English markers of discourse, Roy finds that a single sign can have more than one function within the lecture. For example, she finds the sign **NOW** is used to convey temporal significance in the real world, as well as to mark temporally the beginning of topics or shifts to sub-topics within the lecture.

She also observes use of a marker **NOW-THAT**, incorporating a one-handed sign for **NOW** with the other hand signing **THAT**, as in “that is the one I am talking about” (for a discussion of different signs that have been glossed as **THAT**, see Liddell, 1980). In the ASL lecture, **NOW-THAT** marks openings of new episodes while also referring back to a prior comment (as in “I am referring to that one”). While Roy finds several discourse markers that appear in gloss form to be similar to other languages (such as English *ok*, *anyway* and *know*), she also finds other markers, such as **NOW-THAT** (a two-handed sign produced in front of the body with a downward movement, with one Y-handshape palm up and the other palm down) and **ON-TO-THE-NEXT-PART**, that are clearly unique to ASL.

In a study of quotations and asides in ASL, Locker McKee (1992) finds the use of two lexical discourse markers: **STOP** (signed with the 5-handshape, palm facing forward away from the signer) and **INDEX-HOLD**. She also finds that the signer uses spatial location to mark aspects of discourse, such as marking an aside deviating from the main lecture by physically leaning or stepping to the side.

The study of discourse markers in sign languages indicates that, as in spoken languages, discourse markers in sign languages function to both bracket and link segments of discourse. Discourse markers in sign languages occur manually, non-manually and spatially.

Constructing Dialogue and Action

Varying accounts of the referential use of space exist, and these have evolved over time. Liddell (1980) and Winston (1991) have used the term “pantomime” as a descriptor for this aspect of discourse. While there have been many grammatical ac-

counts of this spatial aspect of sign language discourse, many researchers describe the referential use of space as a pragmatic and discourse-level, rather than a grammatical, phenomenon (these include DeMatteo, 1977; Roy, 1989b; Winston, 1991; 1992; Liddell, 1995; Metzger, 1995; van Hoek, 1992; 1996; Liddell and Metzger, 1998). In particular, Roy (1989) follows Tannen (1989) and her observation that reported speech in discourse is seldom really a true report. Tannen suggests that speakers construct the dialogue of those in their stories, even dialogue originating from real conversations, adapting the discourse so that it fits appropriately the new social context, participants and the point that they hope to convey. For example, Tannen (1989), in her taxonomy of constructed dialogue, describes 10 different types. One type is choral dialogue in which the discourse represents the dialogue of many people—as in “And then all the Americans said, “Oh, in that case, go ahead” (Tannen, 1989: 113). Another is the dialogue of non-human speakers—as when, in speaking for a cat, someone utters, “She says, ‘I see a beautiful world just waiting for me’” (p. 118). In both of these cases, it is clear that the construction of discourse for others is not truly a representation of what was said, since rarely would one find a group of people uttering an identical sentence simultaneously, nor do we expect to hear speech from a cat.

Roy (1989b), Winston (1991; 1992), Metzger (1995) and Liddell and Metzger (1998) examine aspects of constructed dialogue in ASL, finding that, in sign language discourse, actions as well as discourse are constructed in narratives. Winston (1992) describes the construction of action and dialogue by signers as “performatives” that use space to “build” the elements of the narrative scene. Metzger (1995) builds on the

analysis and uses Tannen’s (1989) taxonomy to examine the occurrence of both constructed dialogue and constructed action in ASL in a series of sociolinguistic interviews. Metzger finds examples of six of the 10 types of constructed dialogue from Tannen’s spoken language data occurring in Metzger’s sign language data. Interestingly, seven out of eight of these categories that could pertain to constructing actions (such as constructing the actions of a cat) occur in the ASL data. Metzger finds that the signers utilize constructed action as a way of directly representing the actions of characters within a “storyworld”, and that signers can indirectly represent the actions of characters through narration (such as using classifiers and/or gestures to describe rather than demonstrate the actions of characters within the narrative). In her data, signers also use a combination of both direct and indirect constructed action. For example, when a signer is describing a card game at which one of the seated players looks up to reply to someone who has just approached the card table, the signer both signs LOOK-UP and moves his head up and to the right, as he begins to construct the actions of that character (looking up and holding a handful of cards) as well as his dialogue (his response to the newcomer’s utterance). While research suggests that constructed action plays a very prominent role in ASL narratives (see, for example, Mather and Winston, 1998; Liddell and Metzger, 1998), the construction of characters’ actions is by no means limited to sign language discourse (see, for example, McNeill, 1992).

In the Oklahoma City Bombing narrative, the signer constructs his actions from the time within the “storyworld,” demonstrating his actions at the moment he looked up and saw someone crying in his class:

WELL GET-UP (CL: people standing in semi-circle)

So, everyone stood-up

BE QUIET. STAND. BE QUIET . . .

and we were all standing there quietly,

#THEN FEW MINUTE PRO-1 OPEN-EYES THINK
ENOUGH TIME. FINISH

*then after a few minutes I opened my eyes because
I thought it had been enough time and we were
done.*

PRO-1 CL:9 (eyes look up) (rs: startled) HOLD-IT.

SILLY! STUDENT CRY+++

*But when I opened my eyes and looked up at the
class I was surprised to see someone crying.*

LOOK-AT, WOW TOUCH-HEART.

And it really got to me . . .

When the signer uses the first person pronoun to indicate that he looks up and is surprised, he is not talking about the moment in which he is *telling* the story, but rather the moment within the story, at the time that he was teaching his class a week after the bombing took place. If his story were not a personal experience narrative, he would still be able to use a first person pronoun to refer to the person within the storyworld, even if that were a totally different person (and not simply himself at another time).

The use of constructed action and dialogue in ASL allows for discourse features, such as the conversational historical present (Woltson, 1979), that are also found in other languages, albeit with different linguistic features. This aspect of sign language discourse has also been examined, following various theoretical perspectives, in many sign languages, including British Sign Language (Morgan, 1999), Danish Sign Language (Engberg-Pedersen, 1995), Swedish Sign Language (Ahlgren, 1990a) and Québec Sign Language (Poulin and Miller, 1995). Thus, the use of space for referential shift purposes is clearly an integral feature of the discourse of many sign languages.

Cohesion

Cohesion in discourse refers to those linguistic features that allow the discourse to be constructed and understood in a coherent manner. Cohesion can be identified based on linguistic structures that link different parts of discourse, such as referring terms (by using a pronoun to refer to a prior lexical noun, for example). In signed discourse, cohesion can be found not only lexically and grammatically, but also spatially. The analysis of the use of space for cohesive purposes in sign languages comes in large part from the work of Winston (1993; 1995) and her examination of cohesion in ASL, particularly the mapping of comparative discourse frames in an ASL lecture. In her examination of an ASL lecture on poetry, she finds that the signer establishes one side of the signing space to refer to poetry as art and the other side to refer to poetry as science. Once the concepts have been established in this way, the signer can refer to one or the other side of the signing space and the addressees can interpret him to be referring to the concepts and comparison he has previously established. In fact, the addressee finds that the signer refers to his introductory spatial map as many as 700 utterances later, even when it is embedded within a separate comparative discourse frame (Winston, 1995: 96).

In the Oklahoma City Bombing narrative, cohesion can be seen in the spatial reference that is first established with an index after the first mention of Oklahoma City:

HAVE TWO STUDENT FROM O-K-A C-I-T-Y IX-
loc

*and I have two students who are from Oklahoma
City.*

Then, at the end of the narrative, the signer refers twice to the same spatial location, indicating reference back to this prior spatial indexing:

**FIND POSS-3 SEVERAL FRIENDS DIE PRO-3 (wh)
IX-loc TOO**

I found out they lost several friends that day.

**S-O PRO-3 KNOW SOME PEOPLE IX-loc. WOW
LOOK-AT WONDER. TOUCH-HEART WOW**

So I had students who actually knew some of the people who died in the bombing. Really me think!

Pointing to places within the signing area for the purpose of referring to conceptual referents in the minds of addressees is referred to as “referential spatial mapping.” According to Winston (1992), spatial mapping plays an extremely important role in the structuring of discourse and in involving addressees in making sense of the discourse that they see. Winston finds that spatial maps can be used for a variety of purposes, including comparisons, performatives (constructing actions and dialogue), and the mapping of events temporally. Mather and Winston (1998) find that spatial maps can be used to structure the entire telling of a story (translated from written English to ASL), as space is used to map the story’s topics and to involve the addressees in the creation of the meaning of the story segments and the story as a whole.

The use of space is not the only feature of sign language discourse that reflects cohesive devices. Another example of cohesion in ASL can be found in the phonological production of fingerspelling. Rapid fingerspelling can be used for co-reference once careful fingerspelling has established a referent in the prior discourse (Johnson, 1994b; Patrie and Johnson, in preparation). Finger-spelling and the use of space are two examples of strategies that are unique to sign languages that incorporate the more universal discourse feature known as cohesion.

Rhythm, Rhyme, and Repetition

Discourse marker use of space for comparatives, performatives and fingerspelling all

offer coordination and coherence in discourse between speakers and addressees. Many other aspects of discourse can be found to provide coherence and, further, to entice the addressee not only to attend to, but also to relate actively to what is being uttered. For example, Tannen (1959) discusses ways in which the rhythm of spoken discourse captures addressees, as well as the strategies by which utterers capture attention and involve them in the process of interpreting meaning. She suggests that spoken languages use phonology to create what she calls “music” with language, as a rhythmic way of engaging addressees.

In the Oklahoma City Bombing narrative, the use of repetition can be seen as a strategy that entices the addressees through the signer’s own evaluation of the significance of what he experienced:

**PRO-1 CL:9 (eyes look up) (rs: startled) HOLD-IT.
SILLY! STUDENT CRY+++**

But when I opened my eyes and looked up at the class I was surprised to see someone crying.

LOOK-AT, WOW TOUCH-HEART.

And it really got to me . . .

**(rs: IX-loc) FIND POSS-3 SEVERAL FRIENDS DIE
PRO-3 (wh)IX-loc TOO**

I found out they lost several friends that day.

**S-O PRO-3 KNOW SOME PEOPLE IX-loc. WOW
LOOK-AT WONDER. TOUCH-HEART WOW**

So I had students who actually knew some of the people who died in the bombing. Really made me think!

In particular, the signer uses repetition to emphasize the impact of knowing someone who had lost friends in the bombing incident. He also modulates the speed of his signs during these sections, for instance by slowing down his pronunciation of WONDER. These phonological involvement strategies have been described in some detail in ASL by Winston (1998) in her discussion of sign

language prosody. She finds that nonmanual information conveyed by the eyes, head, face, shoulders, torso and arms/hands can be altered qualitatively in terms of their movement in space and in terms of features, such as speed, tenseness, size, direction and repetition of movement. She suggests that these can occur in combination and/or be combined with pauses, and that they impact the rhythmic production of signs, phrases, idea units and other units of discourse.

These features have specifically been found in the examination of visual rhythms in signed discourse. Mather (1989) examines the ways in which teachers sign stories from books to deaf students. In her study of a children's book, *The Three Little Kittens*, she finds that a number of visual involvement strategies are used by the teacher who is a native signer of ASL. For example, the teacher signs on the pages of the book using "miniature" signs, as a visual involvement strategy that represents a change at the phonological level (one that is not possible in spoken language discourse). According to Mather (1989), miniature signs are those produced by the teacher while resting the storybook on her lap. By signing on the book, the teacher allows the students to see both the illustrations and the ASL translation. Although the use of miniature signs is only one of many strategies described by Mather, it is clearly one unique to sign language discourse, and this allows the signer to draw the addressees into the narrative by representing the actions of the characters illustrated on the pages of the book. Another of the strategies used by the teacher is to translate sound-related words from the English story to visual concepts, such as the *meows* of the kittens being conveyed with the sign glossed as CRY. Mather (1996) has also found that signers use space and repetition rhythmically as a strategy to involve children in stories.

Repetition as an involvement strategy has also been found in ASL lecture discourse (van Hoek et al. 1989; Winston, 1991; 1993; 1994). Repetition can happen at all linguistic levels. Winston (1991; 1993; 1994) examines repetition of spatial reference as a cohesive device. That is, if a signer establishes two concepts to be compared — one on the right side of the signing space and the other on the left — then signing using the hand on one particular side of the signing space is a way of indicating that that discourse is linked to the respective concept. Such repetition occurs through a variety of strategies on the part of the signer, not only by locating signs in a particular part of the signing space, but also by gazing toward a particular location, or by reversing hand dominance (Winston, 1994). The use of visual involvement strategies, constructed action and dialogue, and repetition have also been found in the translation of written English stories to ASL in Mather and Winston (1998).

Sign languages use visual rhythms, rhymes and repetition to create cohesive discourse and involve addressees. The fact that features such as rhythm and rhyme, originally described on the basis of spoken language discourse, can be seen to play a role in visual languages demonstrates that discourse-level features, like grammatical ones, constitute a rich and vital aspect of sign language discourse.

THE RELEVANCE OF DISCOURSE GENRE

The focus of this chapter has been on the description of discourse-level features that have been examined in sign language discourse. However, discourse takes many forms. While a variety of features have been discussed here, the function, frequency and types of features that occur in discourse can vary depending on whether the discourse is monologic or dialogic, or what genre of

monologue—be it lecture, sermon, dialogue, meeting or classroom—is taking place, as well as on whether or not the interaction is interpreted.

Of the features discussed in this chapter, few can be clearly labeled as solely monologic or dialogic. For instance, one of the most strikingly conversational features is turntaking, since turntaking is generally a feature exclusive to discourse involving two or more participants. Nevertheless, as Tannen (1989) points out, conversation forms the basis from which narrative discourse is born. And, just as narratives creep into the midst of most human conversations—as people share their personal experiences and ideas as a part of work and daily life—so, too, the construction of conversations creeps into the midst of many narratives. As discussed earlier in this chapter, the use of constructed dialogue is a discourse strategy in which the signer “relives” or reenacts (or, really, “creates” as Tannen has pointed out) the discourse, including turntaking, between two or more characters in the narrative.

The notion of conversation as the foundation of discourse is intuitive if one considers social interaction itself: the desire to communicate through language is a direct outgrowth of interaction between two or more people. The result of this is that all of the features discussed in this chapter have a place in signed conversational discourse. It has been seen that conversational partners take turns and repair their discourse, they mark their place in their own discourse and within the conversation as a whole, they use space and other cohesive devices and involve their conversational partners with the use of narratives and involvement strategies such as rhythm, rhyme and repetition. Moreover, in addition to the research on signed conversations in face-to-face interaction (see, for example, Baker, 1977; Martinez, 1993, 1995; Thibeault, 1993; Dively,

1998), researchers have also examined the features of tty discourse in the text telephone conversations of members of Deaf communities. For example, Mather (1991) examines the role of discourse markers, such as OH, in tty conversations among deaf Americans. Similarly, Glaser (1999) analyzes the text conversations of British tty users, finding that mutual constraints of text-based communication and natural conversation result in a uniquely organized type of conversational encounter. The more research that is conducted on conversational features of signed discourse, the clearer it becomes that more research is necessary. A quick examination of one feature, turntaking, makes that very clear.

In Glaser's (1999) findings, the structure of turntaking in tty conversations is found to be well organized. As tty users are aware, turntaking in tty conversations is regulated by explicit markers, specifically the use of typed GA. Thus, the examination of the text-based telephone communication of Deaf communities provides one example of how a single feature, turntaking, can vary from its use in general (face-to-face) conversation.

Another example of an important distinction of a single feature, turntaking, can be studied in the context of the prevalent use of interpreters by members of Deaf communities when interacting with hearing interlocutors. For instance, Roy (1989a) has researched turntaking in an ASL–English interpreted interaction. She finds that the complex interrelationship between the two differently regulated languages results in a need for interpreters to act as regulators of turntaking, sometimes yielding a turn to one participant and other times holding a turn for another participant. Her groundbreaking research makes it clear that, despite frequent expectations to the contrary, interpreters cannot simply relay utterances when interpreting interactional discourse. In a

follow-up study, Sanheim (2000) finds similar results in an interpreted medical examination. Clearly, the study of turntaking regulators and other interactional features found in interpreted discourse in other settings might also yield new information about the structure of signed interaction.

Finally, while turntaking has features commonly found in face-to-face conversations, these features are likely to be used in special ways in particular settings, such as classrooms. For example, Mather (1987) finds that teachers working in classrooms with deaf children use two kinds of eye gaze to regulate turntaking. In her data, eye gaze directed at individual students preceding a gaze intended for the whole group is much more effective than simply starting with a group gaze. Moreover, she finds that the native signer in her research is the one to use the effective strategies, while a hearing non-native signing teacher does not. She finds that the teacher's communicative competence has a direct impact on the attentiveness and behavior of the students. Such information is useful in the training of teachers (as well as in the selection criteria for teachers being hired).

Taking a look at the varying structures of a single feature of conversational discourse, turntaking, when applied to a variety of contexts, makes it clear that the features of conversational discourse are quite dynamic. Fortunately, a growing pool of research addresses conversational discourse features, and, hopefully, even more research is yet to be done regarding each of these features in both two-party and multiparty conversations, in-person and on the telephone, both with and without interpreters, and in different settings, such as meetings, interviews and classrooms.

Like conversational discourse, monologic discourse takes many forms. For example, narratives, such as those that relate

personal experiences, emerge in conversations. While much of the research on narratives in sign language discourse are analyses of elicited narratives (rather than videotaped as a part of conversations: see, for example, Gee and Kegl, 1983; Metzger, 1995; Emmorey and Falgier, 1999). Wilson (1996) has the opportunity to apply the conventional Labovian taxonomy of personal experience narratives to an ASL narrative that occurs during a videotaped conversation between six deaf signers. Labov (1972c) divides the structure of spoken personal experience narratives into five parts:

1. abstract: introductory summary of the story;
2. orientation: description of setting;
3. complicating action: events within the story;
4. evaluation: speaker's reasons for telling the story;
5. coda: the "punchline," the shift back from narrative-time to present time.

Wilson also includes in her analysis the narrative units identified by Gee (1986), dividing a narrative into lines and stanzas based on prosodic features such as intonation and pausing. Wilson finds that both approaches to the study of conversational narratives apply to the ASL data. Interestingly, she finds that in either approach, constructed dialogue is consistently relevant to the structure of the conversational, personal experience narrative.

More formal narratives are also examined in the literature on signed discourse. For example, Bahan and Supalla (1995) examine line segmentation and the role of eye gaze in the structure of a formal, commercially available narrative, *Bird of a Different Feather*. This analysis builds on Gee (1986) and breaks the narrative down into smaller units of discourse, from chapters, to sections, to strophes, to stanzas, to lines (1995: 173–

176). In their examination of the smallest unit of narrative discourse (the line), they focus on eye gaze—rather than pausing (Gee and Kegl, 1983) or head nodding (Liddell, 1980)—applying the findings of Baker (1977) and Baker and Padden (1978) and the role of eye blinking and gazing in turn-taking to the marking of line boundaries in the ASL narrative.

Bahan and Supalla find two basic types of eye gaze behavior in the narrative: gaze to the audience and character's gaze. Both of these types of eye gaze serve a particular function. For example, gazing to the audience is a marker of the fact that the signer is narrating the story. When the signer takes on the head posture (such as right or left head turning and eye gaze toward the imagined interlocutor) the signer is constructing the actions and/or dialogue of a character from the narrative. Bahan and Supalla find that the most common demarcation of lines in the segment of narrative that they examined is when there is alternation between these two types of eye gaze. In addition, the line boundaries are marked by a non-gaze behavior, either a pause, head nod or eye blink. They also find that the second type of eye gaze can occur at the end of two lines in a row, but in this case the line boundaries are not only marked with one of the three non-gaze behaviors, but also with either a brief gaze to the audience between lines or with a referential shift.

The study of narrative literary devices in sign languages is not only useful for its many practical applications, such as in ASL teaching and language arts classes, but also in the study of less formal narrative discourse. As Tannen (1989) points out, many of the typically literary devices in spoken languages, such as the use of imagery and detail, serve as involvement strategies in the discourse of everyday conversations. This appears to be true in sign language discourse as well. For

example, in the study of ASL narratives, the role of constructed action and dialogue as a fundamental part of the narrative structure has been found to be true in literary narratives (Bahan and Supalla, 1995; Mather and Winston, 1998), conversational narratives (Wilson, 1996) and elicited narratives (Liddell and Metzger, 1998). Evidence suggests that this is also the case for other sign languages as well (for instance, for a discussion of Québec Sign Language, see Poulin and Miller, 1995; for Danish Sign Language, see Engberg-Pedersen, 1995; for British Sign Language, see Morgan, 1999).

Formal narratives are not the only literary genre of monologic discourse that has been examined. ASL poetry, BSL poetry and the poetry of other sign languages is a form of monologic discourse within the literary realm that has gained increasing recognition and research in recent years (see, for example, Valli, 1994; 1995; 1996). Such research has shown that many of the features of poetry found in spoken languages, including rhythm, rhyme and alliteration, are also prevalent in signed poetry, through such features as eye gaze, body shift, head shift and the selected use of handshapes and movements. This information, in turn, feeds the study of conversation, once again. As Tannen (1989) describes, the role of imagery and detail common to literature can often appear in daily conversational discourse.

In addition to the more literary monologic discourse found in ASL narratives and poetry, some analysis of formal lectures has also been conducted, as seen in the previous sections. For example, Roy (1989b) with a discussion of discourse markers and Winston (1993) with a discussion of cohesion are both based on the analysis of lectures in ASL. Some preliminary research has also been conducted on the discourse of sermons, as signed by deaf pastors. Richey (2000) finds that in ASL sermons, the use of

questions to the congregation as an interactional involvement strategy is a unique feature not often found in the spoken English discourse of hearing pastors. Clearly, a wide variety of both conversational and monologic discourse genres has received the attention of sign language discourse analysts.

A word about sociolinguistic factors is also relevant here. Like all sociolinguistic research, sociolinguistic factors such as age, ethnicity and gender can play a role in the occurrence of such features. For example, Martinez (1995) finds that in FSL, the male signers in her study had longer turns than their female partners. Moreover, Bruce (1993) in a study of six deaf dyads, including both white and African American deaf signers, finds that the use of verbal and non-verbal backchanneling is different for the African American and the white deaf signers, and that African-American–African-American dyads used backchanneling differently from African-American–white dyads.

In addition to such sociolinguistic factors as gender and ethnicity, sign language communities generally include a unique variant used by deaf signers who are also blind. While sighted Deaf community members use a visual sign language, Deaf-Blind signers often use a tactile variety of that language. For example, Collins and Petronio (1998) find that Tactile ASL exhibits variation from visual ASL at a variety of linguistic levels, including phonological, in terms of movement, orientation and location, and morphological, in terms of the presence or absence of facial configuration with the co-occurring muscle tension and movement patterns that conveyed adverbial and adjectival information in their data.

Clearly, research regarding the impact of sociolinguistic factors on discourse suggests that a great amount of research remains to be done both across sign languages and

within sign languages in order to study the features of signed discourse within different genres and based on a variety of sociolinguistic variables.

CONCLUSION

Discourse analyses of sign languages make clear the necessity for examination of sign language discourse at levels above the sentence, both for the improved understanding of sign language structure and for the understanding of language in general. These studies also have practical implications for professionals in a variety of fields. For example, for educators — regardless of whether they are engaged in first or second language teaching — developing discourse-level skills in learners is essential in order to be able to interact smoothly, coherently and successfully. It also has implications for the field of interpretation. Interpreters generally are expected to convey equivalent messages when translating between two languages. Interpreters who attempt to provide equivalence at a lexical or sentential level are potentially missing aspects of the discourse as a whole (such as cohesion). Discourse analysis of sign languages provides important information, both theoretical and practical.

A large portion of the linguistic work performed since Stokoe's ground breaking findings in the 1960s has focused on theoretical issues and formalist perspectives. Discourse analysis is grounded in the fact that language is used when people interact, and that the study of language in use can provide information to support or refute theories generated non-empirically. Sociolinguistic research by discourse analysts about visual languages and the Deaf communities that use them is increasing globally. This functional perspective is, perhaps, long overdue in the bulk of sign language research. It is likely that the analysis of signed discourse

based on the approaches described here will contribute immensely in the years to come to our understanding of both sign languages and language in general.

SUGGESTED READINGS

This chapter draws heavily from both the spoken language literature and the sign language literature on discourse analysis. For a general description of discourse analysis and issues that motivate this interdisciplinary field, van Dijk (1997a; 1997b) is an excellent source. Regarding the approaches to the analysis of spoken language discourse, Schiffrin (1994) provides a comprehensive overview of the six approaches summarized in this chapter. She not only provides detailed descriptions and comparisons of the approaches, but also includes sample analyses for each. These two books provide information about the field that is neither limited to one approach or to one theoretical perspec-

tive. For more specific information on a given approach or methodology, see the citations within that section of the chapter.

An exceptional source for the study of sign language discourse is Lucas's series *Sociolinguistics in Deaf Communities*, since every volume includes at least one chapter that focuses on sign language discourse. Specifically, volume 5 of the series, *Storytelling and Conversation: Discourse in Deaf Communities* (Winston, 1999) contains eight chapters that address the signed discourse of a variety of countries and is based on a variety of approaches. Additionally, for further information regarding the use of space in sign language discourse, Emmorey and Reilly's (1995) *Language, Gesture, and Space* includes 19 chapters that focus on spatial issues. While many of these focus more on the grammatical level than on the discourse level, several of the chapters in this book offer empirical analyses of sign languages above the level of the sentence.

Language Contact in the American Deaf Community

CEIL LUCAS AND CLAYTON VALLI

INTRODUCTION

One of the major sociolinguistic issues in the deaf community concerns the outcome of language contact. Specifically, there exists a kind of signing that results from the contact between American Sign Language (ASL) and English and exhibits features of both languages.¹ It has been claimed (Woodward 1973b; Woodward and Markowicz 1975) that this kind of signing is a pidgin and that it is the result of deaf-hearing interaction. The goal of this study is to reexamine this claim, based on a preliminary structural description of contact signing resulting from naturalistic interaction. The objectives of the study are (1) to describe the data collection methodology used to induce switching between ASL and this contact signing;² (2) to describe the sociolinguistic factors that sometimes correlate with the production of signing other than ASL; and (3) to describe some aspects of the morphological, syntactic, and lexical structure of the contact signing. The preliminary evidence suggests that the outcome of language contact in the American deaf community is unique, and quite different than anything that has been described to date in spoken language communities. The overall goal, then, is re-

examination as a way of getting at an accurate characterization of this unique and complex phenomenon.

The first step toward understanding language contact in the deaf community involves recognizing the complexity of the contact situation with respect to not only the characteristics of participants but also the varieties of language available to those participants. For example, with participant characteristics, it is clearly not enough to simply distinguish deaf individuals from hearing individuals. Participants in a contact situation can be deaf ASL-English bilinguals who attended a residential school at an early age (entering, say, at age three or four), learned ASL as a first language from other children, and were taught some form of English, usually by hearing teachers who did not sign natively.³ Alternatively, the participants can be deaf individuals who were mainstreamed at an early age and learned to sign relatively late, whether with ASL, signed English, or both. Or, they can be the hearing children of deaf parents, again ASL-English bilinguals who learned ASL at home natively. They can even be hearing individuals who learned ASL or some variety of signed English relatively late in life. Participants in a language contact situation

Source. Reprinted by permission of the publisher, from C. Lucas, ed., *The Sociolinguistics of the Deaf Community* (1989): 11–40. San Diego: Academic Press. Copyright © 1989 by Academic Press, Inc. The references for this reading can be found in the original volume.

Note. This reading contains the preliminary findings of the project. A full account of the project appears in C. Lucas and C. Valli. 1992. *Language contact in the American deaf community*. San Diego: Academic Press.

can also include hearing individuals who are English monolinguals and do not sign, as well as deaf ASL monolinguals with a minimal command of English in any form. Similarly, the varieties of language available to participants in a contact situation range from ASL to spoken English or signed English, and to a variety of codes for English that have been implemented in educational settings. (See Ramsey, [original volume].) The participants in any given language contact situation may have been exposed to some or all of the above and may display a wide range of linguistic skills. Finally, it is crucial to understand that the participants in a language contact situation have both the vocal channel and the visual channel available, the latter including both manual and nonmanual grammatical signals. That is, the participants in a language contact situation have hands, mouth, and face available for the encoding of linguistic messages.

With spoken languages, two language communities can be in contact but there may not actually be many bilingual individuals in those communities. The linguistic outcome of language contact in that situation is different from the linguistic outcome of the interaction of bilingual individuals. In turn, the interaction of bilingual individuals who share the same native language is apt to be different from the interaction of bilinguals who have different native languages. Compare, say, two French-English Canadian bilinguals who both speak French as a first language, as opposed to two French-English Canadian bilinguals, one of whom claims French as a first language and the other of whom claims English as a first language. Code-switching can occur in both of these situations, for example, but the reasons for it and the linguistic form it takes can be quite different. And this is all in contrast, finally, with the interaction of a bilingual speaker with a monolingual speaker, whether that interaction is con-

ducted in the second language of the bilingual (and the native language of the monolingual), or vice versa. The case of a Spanish-English bilingual interacting with a monolingual English speaker is but one example. If the bilingual's first language is Spanish and the interaction is in English, the linguistic outcome of the interaction will probably be different from any interaction in Spanish with the monolingual who is in the earliest stages of learning Spanish.

Parallels exist for all of these situations in the deaf community, and, as explained earlier, participant characteristics can vary widely between language contact situations. The following is a partial outline of possible language contact situations in the American deaf community, according to participant characteristics:

- Deaf bilinguals with hearing bilinguals
- Deaf bilinguals with deaf bilinguals
- Deaf bilinguals with hearing spoken English monolinguals
- Hearing bilinguals with deaf English signers
- Deaf bilinguals with deaf English signers
- Deaf English signers with hearing spoken English monolinguals
- Deaf English signers with hearing bilinguals
- Deaf English signers with deaf ASL monolinguals
- Deaf bilinguals with deaf ASL monolinguals
- Deaf ASL monolinguals with hearing bilinguals

ISSUES OF DEFINITION

Several issues arise from this outline. One concerns the problematic and relative concept of bilingualism. As in spoken language situations, participants in language contact situations in the deaf community display a range of competence both in ASL and in English, and in the latter, both in forms of

English-like signing and in written English. For the purposes of the present study, bilingualism is defined in demographic terms: Deaf bilinguals are individuals who not only learned ASL natively, either from their parents or at an early age from their peers in residential school settings, but also have been exposed to spoken and written English all their lives, beginning with the school system and continuing into adulthood through interaction with native English speakers. In contrast, hearing bilinguals are native English speakers who learned to sign as adults, both through formal instruction and through interaction with deaf people. Although not native ASL signers, hearing bilinguals do not use manual codes for English, either. Specific sign use in the present study will be discussed later. Again, it is crucial to recognize a range of competence in hearing bilinguals. For example, the linguistic outcome of an interaction between a hearing child of deaf parents (hence, possibly, a native user of ASL) and a deaf bilingual can be quite different from that of a deaf bilingual and a hearing bilingual who, while competent, learned ASL as an adult.

Another issue that arises concerns the distinction between deaf people and hearing people. Informal observation and anecdotal evidence suggest that this distinction is an important variable in the outcome of language contact in the American deaf community. Deaf individuals not only can sign quite differently with other deaf individuals than with hearing individuals but also can initiate an interaction in one language and radically switch when the interlocutor's ability to hear is revealed. For example, a deaf native ASL user may initiate an interaction with another individual whom he believes to be deaf or whose audiological status has not been clarified. The latter participant may well be a near-native user of ASL. Once the latter's hearing ability becomes appar-

ent, however, it is not unusual for the deaf participant to automatically switch "away from ASL" to a more English-based form of signing. Code choice is thus sensitive to the ability versus inability of participants to hear and this distinction is carefully attended to in the present study of contact phenomena in the deaf community.

One might predict that the different contact situations outlined earlier here yield different linguistic outcomes, all of them of interest. For example, there is substantial informal observational evidence that when speaking English away from deaf individuals, hearing bilinguals occasionally code-switch into ASL and code-mix English and ASL features. Another outcome is seen, when, in interaction with hearing individuals who do not sign at all, a deaf bilingual who does not otherwise use his voice (in interaction with other deaf people or with hearing people who sign) opts to use spoken English in combination with gestures. Similarly, there is informal observational evidence that in interacting with hearing individuals who are in the early stages of learning to sign, deaf native ASL users use a form of "foreigner talk." Finally, the outcome of language contact between native signers of different sign languages (for example, ASL and Italian Sign Language) can have unique characteristics. There is anecdotal and casual observational evidence for the existence of all of the language contact situations outlined. What is clearly required at this point is carefully collected ethnographic data on videotape and descriptive analyses of these interactions.

The present study focuses on the outcome of language contact in the first situation in the outline: deaf bilinguals with hearing bilinguals. The reason for choosing this focus is that characterizations of language contact in the American deaf community have thus far been limited to the interaction between deaf people and hearing people,

and this interaction contact has been characterized as producing a kind of pidgin. As stated earlier, one of the objectives of this study is to reexamine this characterization, in part by way of a preliminary description of the lexical, morphological and syntactic features of language production that result from the interaction of deaf and hearing people. There are suggestions in the literature that the outcome of the interaction of deaf bilinguals with other deaf bilinguals is sometimes a language variety other than ASL. In the present study, we collected considerable data on such interactions, a very general description of which is provided here. A detailed linguistic analysis of the deaf-deaf variety of interaction, as well as a comparison of that variety with the hearing-deaf variety, are reserved for future study.

THE OUTCOME OF LANGUAGE CONTACT

Given the variety in both participant characteristics and languages available, it is not surprising that the linguistic outcome of language contact is something that cannot be strictly described as ASL or as a signed representation of English. The issue is not that contact signing occurs, nor what label to attach to the system of signs, but rather how to characterize the system. Contact signing is

characterized as “an interface between deaf signers and hearing speakers” by Fischer (1978, 314) and is labeled Pidgin Sign English (PSE) by Woodward (1972, 1973b). The linguistic characteristics of this so-called PSE are examined in three studies: Woodward (1973b), Woodward and Markowicz (1975), and Reilly and McIntire (1980). Woodward (1973b, 17) states that “Sometimes people sign something that seems to be a pidginized version of English. The syntactic order is primarily English, but inflections have been reduced in redundancy, and there is a mixture of American Sign Language and English structure.” Further details are provided (Woodward 1973b, 42):

These characteristics point up some close similarities between PSE and other pidgins. In most pidgins, articles are deleted; the copula is usually uninflected; inflections such as English plural are lost and most derivations are lost, just as they are in PSE. Perfective aspect in pidgins is often expressed through *finish* or a similar verb like *done*.

Woodward (1973b) and Woodward and Markowicz (1975) provide a description of some of the linguistic characteristics of PSE, which are summarized in Table 1. Their

Table I. Linguistic Characteristics of Pidgin Sign English (PSE)

| Feature | ASL | Sign English | PSE |
|-------------|-------------------------------------|--------------|---|
| Articles | No | Yes | Variable: A, T-H-E (fingerspelled) |
| Plurality | Noun pluralization by reduplication | -s, etc. | Some reduplication, generally does not use marker to represent English s plural |
| Copula | No | Yes | With older signers, represented by the sign TRUE |
| Progressive | Verb reduplication | -ing | “PSE retains verb reduplication in a few heavily weighted environments, e.g., ‘run’, ‘drive’. PSE uninflected copula or inflected forms plus a verb for Standard English be + ing. PSE, however, drops the redundant + ing” (Woodward 1973b, 41). |
| Perfective | FINISH | | FINISH2, an allomorph of ASL FINISH |

inventory of features includes agent-beneficiary directionality, negative incorporation, and number incorporation. They also discuss PSE phonology, specifically, handshapes, location, and movement.

Reilly and McIntire (1980, 151) define PSE as “a form of signing used by many hearing people for interacting with deaf people and thus is a commonly encountered dialect of ASL.” They (1980, 152) point out that

Although PSE has been classified as a pidgin language, it differs from most pidgins in important ways. . . . Syntactically, PSE does not appear as many other pidgins. Because it does make use of a number of English grammatical devices for creating complex sentences, it has access to a wider range of grammatical constructions than do most pidgins.

The PSE label is very widely used and the analogy with spoken language pidgin situations and language contact in general is extended to include the idea of diglossic variation along a continuum. The suggestion that Ferguson’s (1959) concept of diglossia might be applicable to the deaf community was first made by Stokoe (1969). By the low (L) variety, Stokoe is referring to ASL. As he (Stokoe 1969, 23) states, “The H (‘superposed’ or ‘high’) variety is English. However, this English is a form most unfamiliar to usual linguistic scrutiny. It is not spoken but uttered in ‘words’ which are fingerspelled or signed.” As Lee (1982, 131) points out, “The concept of a sign language ‘continuum’ linking the H and L varieties . . . has become quite popular. This continuum represents a scale of all the varieties of ASL and English produced by both deaf and hearing signers. These varieties im-

perceptibly grade into ASL on one extreme and English on the other.” It is claimed that a number of varieties exist along the continuum, and it is some complex of these varieties that the label PSE is said to identify.

A notable problem with earlier descriptions concerns lack of data or problems with the data used to back up claims about the linguistic nature of the signing being described. Neither in Woodward (1973b) nor in Woodward and Markowicz (1975) is there any description of the sample that serves as the source for the list of features proposed for PSE. Woodward (personal communication, 1988) has indicated that the description of PSE was based in part on a sample from his dissertation: 140 individuals, ranging in age from thirteen to fifty-five, with 9 black signers and 131 white signers. But these data are still problematic as the basis for a description of language contact because (1) the data were elicited by a hearing researcher on a one-on-one basis with the use of a questionnaire, and were not interactional; and (2) the signers providing these data range from deaf native ASL signers to hearing nonnative signers, making it virtually impossible to separate out features of the language produced that are a function of language contact from features that are a function of second-language acquisition. For example, Woodward and Markowicz (1975, 18) claim that the ASL rule of negative incorporation can occur in PSE, but that “deaf signers use more negative incorporation than hearing signers.” This may indeed be true, but it might also reflect a difference in language competence (i.e., native signers knowing and competently using a rule that nonnative signers may be in the process of learning), rather than a reflection of language contact between hearing and deaf signers.

It seems that deaf language production and hearing language production in a language contact situation are necessarily different by virtue of differences in language acquisition backgrounds. Also, the features of contact signing (PSE) cannot be described based on data that not only combine native and nonnative signers' productions but also are not interactional. Researchers are certainly aware of the need to distinguish between native and nonnative production. In fact, Lee (1982, 131) reports that

Stokoe (personal communication) suggests that there may in fact be two PSE continua: a PSEd produced by deaf signers and a PSEh produced by hearing signers. PSEd is likely to have more ASL grammatical structures and to omit English inflections. PSEh tends to have greater English influence and rarely approaches the ASL extreme of the continuum.

The need for separation of data sources is thus recognized, but this need is not reflected in the actual descriptions of PSE that are produced. Thus, Reilly and McIntire (1980) base their description of the differences between PSE and ASL on videotapes of a children's story that was signed by four informants. Three of these informants are hearing. Three have deaf parents and two of the three hearing informants did not use sign in childhood. The instructions for different versions of the story were given either in ASL or, as Reilly and McIntire (1980, 155) describe, "in PSE and spoken English simultaneously . . . or interpreted, i.e., signed as they were being read aloud by the investigator."

Although there is an awareness of the need to control for the variable of signer skill, and even though the description of

PSE is based on videotaped data, the problem of separating the consequences of language contact from the consequences of second language learning arises in Reilly and McIntire's (1980) study. In their conclusions, they (1980, 183) observe:

It seems that there is a gradation from structures that are more obvious to the language learner (classifiers and directional verbs) to those that are more and more subtle (sustained signs and facial and other non-manual behaviors). This gradation is reflected in differential usage by different signers.

Once again, we encounter the "apples and oranges" dilemma resulting from descriptions of PSE based on the sign production of signers with different levels of competence and ages of acquisition. Furthermore, data collection in analogous spoken language situations does not typically yield naturalistic data, and, accordingly, it is not clear that the data upon which Reilly and McIntire's description of PSE is based bear any resemblance to language production in a natural language contact situation.

Clearly, any study that proposes to describe the linguistic outcome of language contact in the American deaf community should at the very least take its departure from data collected in naturalistic interactional settings that reflect actual language contact situations as closely as possible. It is fair to say that studies claiming to describe the linguistic outcome of language contact in the American deaf community to date may not reflect the actual situation, owing to either a lack of data or problematic data. In light of the problems presented by the data in research to date, the characterizations of language contact in the American deaf community—pidginization, foreigner

talk, learner's grammars, diglossic continuum—warrant reexamination.

THE PRESENT STUDY

Given the enormous complexity of language contact in the American deaf community, and the problems inherent in earlier studies attempting to describe the situation, we focused on only one particular type of interaction. The major goals of the present study are (1) to provide a preliminary description of the signing of deaf bilinguals when signing with hearing bilinguals, and (2) to base that description on carefully collected data that reflect natural interaction as closely as possible. Toward this end, six dyads of informants were formed. Eleven of the twelve informants rated themselves as very skilled in ASL, and all twelve rated themselves as skilled in English. Of the twelve informants, nine were born deaf, one was born hard of hearing and is now deaf, and two were born hearing and became deaf at fifteen months of age and three years of age, respectively. Five of the twelve came from deaf families, and of the remaining seven, five attended residential schools for the deaf and learned ASL at an early age. One informant learned ASL from other deaf students in a main-

stream program. Considering the family and educational background of all but one of the informants, their self-evaluations of personal language skills are accurate: They are bilinguals who learned ASL either natively from their parents or at a very early age from peers (all but one in a residential school setting). They have had exposure to and contact with English all of their lives. The data from one informant who did not learn ASL until age 21 (born deaf, hearing family) is excluded from the analysis, and, in fact, the video-tapes for this informant reveal minimal use of ASL.

The composition of each of the six dyads is shown in Table 2. The participants in dyads 1 and 2 share similar backgrounds, as do the participants in dyads 4, 5, and 6. Dyad 3 was deliberately "mixed," consisting of one individual born deaf in a deaf family and one individual born deaf in a hearing family, but both having attended residential school. In dyads 1, 3, and 6, the participants did not know each other; in dyads 2, 4, and 5, they did.

In the first part of the data collection, the videocameras were present, but at no point were the technicians visible. The sign production of the six dyads was videotaped during interaction with, first, a deaf inter-

Table 2. Composition of Dyads

| Dyad | Participant A | Participant B |
|------|---|---|
| 1 | Deaf family, born deaf, residential school | Deaf family, deaf at 15 mos., public school |
| 2 | Deaf family, born deaf, deaf day school | Deaf family, born hard of hearing, now profoundly deaf, deaf day school |
| 3 | Deaf family, born deaf, residential school | Hearing family, born deaf, residential school |
| 4 | Hearing family, born deaf, residential school | Hearing family, deaf at age 3, residential school |
| 5 | Hearing family, born deaf, residential school | Hearing family, born deaf, mainstream program |
| 6 | Hearing family, deaf at age 3, residential school | Hearing family, born deaf, learned ASL at age 21, public school |

viewer who signed ASL, then the dyad alone; next with a hearing interviewer who produced English-like signing and used her voice while she signed, then the dyad alone again; finally, with the deaf interviewer again. The whole interview experience began with exclusive contact with the deaf interviewer.

Each interview consisted of a discussion of several broad topics of interest to members of the deaf community. Four statements were presented and participants were asked if they agreed or disagreed, and why.⁴ It was predicted that (1) the situation with the deaf researcher will induce ASL, but the relative formality of the situation and the presence of a stranger can preclude it; (2) the situation with the hearing researcher will induce a shift away from ASL to contact signing; and (3) the informants alone with each other will elicit ASL. The structure of the interviews in terms of relative formality and informality is summarized in Table 3.

This interview structure has strong parallels with Edwards' (1986) research design for a study of British Black English. Edwards' (1986, 9) major concern in that study was the improvement of methodology "so as to ensure that this corpus authentically reflects the range of individual and situational variation which exists within the black community." Edwards recognized the obvious need for the black interviewers in gaining access to vernacular speech. Edwards (1986, 17)

was assured that the presence of a sympathetic, young Black interviewer, that is, a peer, would guarantee the use of the vernacular by the informants. But

Our observation made it clear that many young black people use Patois only in in-group conversation, so that the presence of any other person, even the young black field-worker, would be enough to inhibit Patois usage. The obvious solution was to create a situation in which the young people were left alone.

As in the Edwards study, participants in the present study were left alone twice and asked to continue discussing the topics introduced by the interviewers. In the first instance, the deaf interviewer was called away for "an emergency phone call." After an eight to ten minute period, the hearing interviewer arrived and explained that she would be taking the deaf interviewer's place. The interview continued and the hearing interviewer then left to check on the deaf interviewer. The dyad was again left alone until the return of the deaf interviewer for the remainder of the interview session. Following the completion of the interview, the participants were told that there had in fact been no emergency, and the reason for the deaf interviewer's departure was explained. The participants viewed portions of the tapes and discussed the purpose of the study with the researchers. All the participants were glad to be told that the "emergency" was false, but accepted it as part of the data collection procedure.

Based on a preliminary examination of the data, some important observations can be made. These observations fall into two broad categories: (1) the overall pattern of language use during the interviews, and (2) the linguistic properties of the contact signing produced by deaf native ASL

Table 3. Interview Structure

| Situation Type | Formal | Informal |
|--------------------------|--------|----------|
| With deaf interviewer | + | |
| Dyad alone | | + |
| With hearing interviewer | + | |
| Dyad alone | | + |
| With deaf interviewer | + | |

Table 4. Distribution of Language Choice, by Interview Situation and Participant

| Situation | Dyad 1 Participants | | Dyad 2 Participants | | Dyad 3 Participants | | Dyad 4 Participants | | Dyad 5 Participants | | Dyad 6 Participants | |
|--------------------------|---------------------|--------------------|---------------------|--------|---------------------|--------|---------------------|----|---------------------|--------|---------------------|--------|
| | A | B | A | B | A | B | A | B | A | B | A | B |
| With deaf interviewer | ASL | CS/SE ^a | ASL | ASL/CS | ASL/CS | CS | ASL | SE | ASL | CS | ASL | CS |
| Dyad alone | ASL | CS | ASL | ASL | ASL/CS | ASL/CS | ASL | CS | ASL | ASL | CS | CS |
| With hearing interviewer | ASL | SE | ASL/CS | CS | CS | SE | ASL | CS | CS | CS | CS | CS |
| Dyad alone | ASL | CS | ASL | ASL | ASL/CS | ASL/CS | ASL | CS | CS/ASL | CS/ASL | CS/ASL | CS/ASL |
| With deaf interviewer | ASL | CS | ASL | ASL/CS | ASL/CS | ASL | ASL | CS | ASL | ASL | ASL | CS |

^aCS, Contact Signing; SE, Signed English, with voice.

signers during deaf-hearing interaction. As assessed by a deaf native ASL user, the distributional pattern of language choice during the interviews is summarized in Table 4.⁵ The information in this table should be read as follows: In the first dyad, participant A uses ASL across all of the situations of interaction; A's language use here contrasts with B's, who uses contact signing and signed English with the deaf interviewer, contact signing with A, and signed English with the hearing interviewer, and so on, for all six dyads. As the distributional contrasts in Table 4 reveal, some participants start out with one kind of signing in a particular condition and then change to another kind of signing, within the same condition. Participant B in dyad 5, for example, produces contact signing with the deaf interviewer. When alone with A, B produces ASL and then produces contact signing again when the hearing interviewer appears. When the hearing interviewer leaves, and A and B are again alone, B continues to produce contact signing for a while and then produces ASL. B continues to produce ASL upon the return of the deaf interviewer and does so until the end of the interview.

In keeping with our prediction, ten of the twelve informants produce a form of signing that is other-than-ASL with the hearing interviewer—either contact signing or signed English with voice. In some cases, the informants produce ASL with the deaf interviewer and while alone with each other, as was expected. However, some unexpected results emerged. For example, three informants use ASL with the hearing interviewer, contrary to a widely held belief that deaf native signers automatically switch away from ASL in the presence of a nonnative signer. Furthermore, two of the informants (1A and 4A) use ASL consistently across all of the situations. One might predict that both of these informants come from deaf families; however, 4A is from a hearing family. Another unexpected result is the production of contact signing both with the deaf interviewer and when the informants are left alone. The deaf interviewer consistently signs ASL, and it was predicted that the informants would produce ASL in this situation and when left alone. But this is not the actual outcome. Indeed, in one case, an informant produces signed English with the deaf interviewer. These results are particularly noteworthy

given another widely held belief that deaf native signers will consistently sign ASL with each other if no hearing people are present. The observations on the overall pattern of language use during the interviews can be summarized as follows:

- Some informants use contact signing or signed English with the hearing interviewer, as expected; others use ASL throughout.
- ASL is used with the hearing interviewer by some informants but not others.
- Contact signing is produced with the deaf interviewer and when the informants are alone.
- ASL is used not only by deaf informants from deaf families but also by deaf informants from hearing families.

These observations appear to challenge the traditional perspective on language contact in the American deaf community. For example, it is traditionally assumed that contact signing (known as PSE) appears in deaf-hearing interaction, mainly for the obvious reason that the hearing person might not understand ASL. On the extreme is the position that the very purpose of contact signing is to prevent hearing people from learning ASL (Woodward and Markowicz 1975, 12). More measured approaches simply describe contact signing as the product of deaf-hearing interaction. Little is said, however, about the use of contact signing in exclusively deaf settings. Although the need for comprehension might explain the occurrence of contact signing in deaf-hearing interaction, it is clearly not an issue in portions of the interviews described here, as all of the participants are native or near-native signers and, in some instances, sign ASL with each other. The choice to use contact signing with other deaf ASL natives, then, appears to be motivated by sociolinguistic factors. Two of three

factors identified in the present study are the formality of the interview situation (including the presence of videotape equipment) and the participant's lack of familiarity in some cases with both the interviewer and the other informant. The videotaped data also clearly present counter-evidence to the claim that deaf people never or rarely sign ASL in the presence of hearing people, as two of the informants chose to sign ASL throughout their respective interviews. This choice may be motivated by other sociolinguistic factors, such as the desire to establish one's social identity as a bona fide member of the deaf community or cultural group, a desire that may supersede considerations of formality and lack of familiarity with one's cointerlocutor(s). Different sociolinguistic factors motivate the language choices of different individuals. This is further illustrated by the differences among informants in language choice within a given interview situation.

Figure 1 provides a more graphic summary of informant language use within the interviews. Three distinct patterns are discernible here. One pattern, as seen with dyads 1 and 4, consists of the two informants using distinctly different kinds of signing and never overlapping with each other. For example, in dyad 1, informant 1A consistently uses ASL throughout the interview, even though 1B starts out with contact signing and signed English, then moves first to contact signing, then to signed English, and then back to contact signing. Similarly, in dyad 4, informant 4A consistently uses ASL, while 4B starts out with signed English and then consistently uses contact signing. Neither 1B nor 4B ever approaches the use of ASL during the interview. The first pattern, then, is that one participant's choice of signing during the interview is consistently distinct from the co-participant's choice or choices.

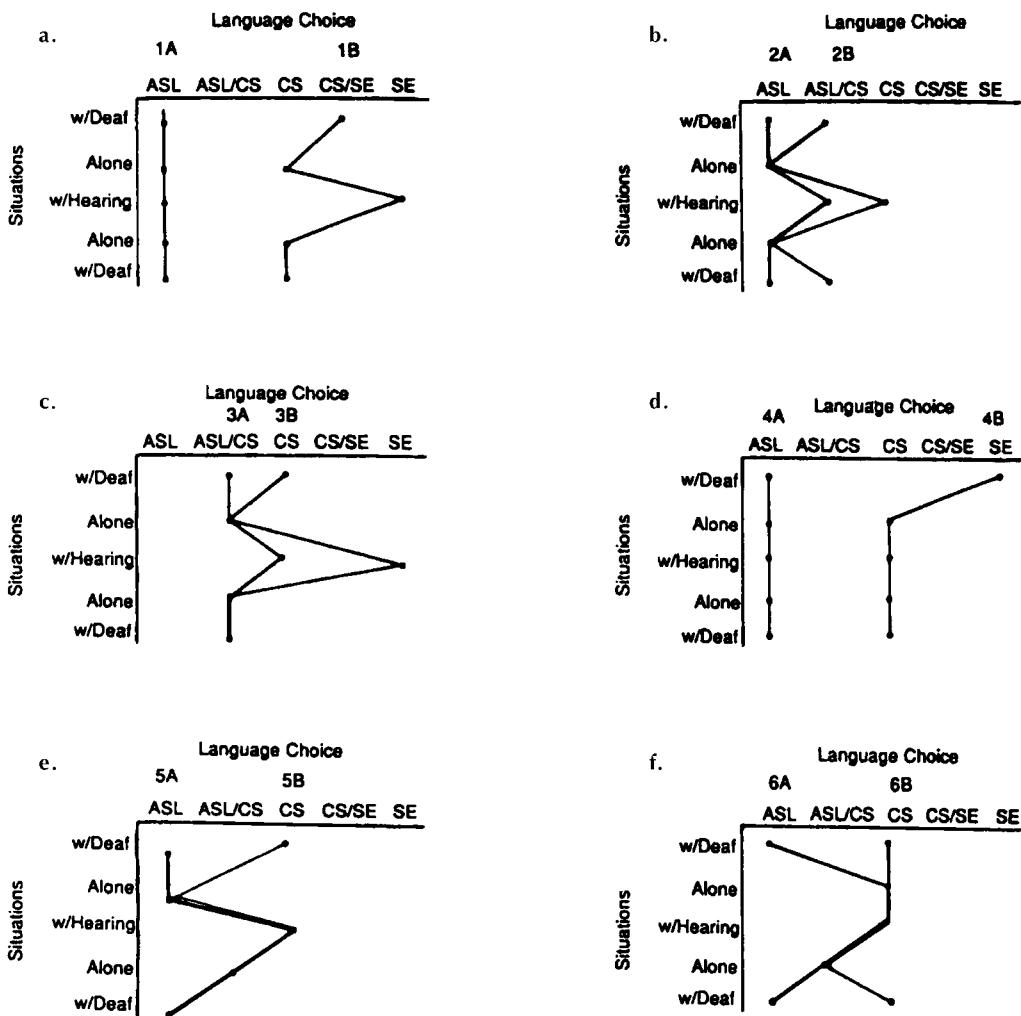


Figure 1. Patterns of language choice: (a) dyad 1; (b) dyad 2; (c) dyad 3; (d) dyad 4; (e) dyad 5; (f) dyad 6.

In dyads 2 and 6, we see a second pattern, where the informants use different kinds of signing during the first part of the interview with the deaf interviewer but, when left alone with each other, use the same kind of signing. In dyad 2, informant 2A continues with ASL, and 2B switches to ASL; in dyad 6, informant 6B continues with contact signing, and 6A switches to contact signing. In dyad 6, the informants use the same kind of signing and switch in the same way towards ASL when left alone

and then sign quite differently with the deaf interviewer. In dyad 2, the informants do not sign in exactly the same way, but they do shift in the same direction. Also noteworthy in both dyads is the fact that despite shifting during the interview, each informant signs the same way with the deaf interviewer at the end of the interview as at the beginning.

The third pattern is seen in dyads 3 and 5, where the informants begin the interview with different kinds of signing. One informant then shifts toward the other, and then

both informants either together use the same kind of signing for the remainder of the interview (dyad 5) or use the same kind of signing, then shift in the same direction, and then together use the same kind of signing again (dyad 3).

One central question is what accounts for the use of different kinds of signing by individual informants within the interviews. Switching that seems to be motivated by the presence of a hearing person can be seen in these data: seven of the twelve informants switch from ASL signing or ASL signing with some contact signing features to contact signing or signed English with voice in the presence of the hearing interviewer. Of the remaining five informants, two consistently sign ASL in all situations; the other three produce contact signing when the hearing interviewer arrives and maintain this choice for the duration of her presence. Five of the twelve informants are from deaf families, and it is important to note that four of those five are among those who switched in the presence of the hearing interviewer. Of the five informants who did not switch with the hearing interviewer, only one is from a deaf family.

Signing behavior produced in the presence of a hearing person does not explain the occurrence of contact signing with the deaf interviewer or when the informants are alone. The use of contact signing in the latter situations can be accounted for by several factors, such as the formality of the interview situation and the lack of familiarity of the informants with the deaf interviewer. Attitudes concerning the kind of signing that is appropriate in different situations have long been noticed and described. Indeed, it is this interrelationship between language attitudes and language choices that prompted Stokoe (1969) to describe the language situation in the deaf community as diglossic—that is, ASL strictly in some con-

texts and a more English-like signing strictly for other contexts, with no overlap. In reexamining this characterization of the language situation in the deaf community as diglossic, Lee (1982, 127) states that although “there is indeed variation [in the deaf community] . . . code-switching and style shifting rather than diglossia appear to be the norm.” Three of Ferguson’s (1959) nine criteria for diglossia are linguistic (lexicon, phonology, and grammar), while six are described by Lee as sociolinguistic (literary heritage, standardization, prestige, stability, acquisition, and function). As she (Lee 1982, 147) observes, “I have found none of the nine characteristics actually consistent with diglossia, at least in some parts of the linguistic community.”

Even though it is not clear at this point what the roles of code-switching and style shifting are in the deaf community, it is clear from Lee’s reexamination of Stokoe’s (1969) work and from the present data that the language situation in the deaf community is not strictly diglossic. Clearly, some of the informants in our study see ASL as inappropriate for any part of the interview. Specifically, informants 1B and 4B never use ASL. Other informants see ASL as appropriate only when no interviewer is present. In each one of the six dyads, a shift occurs when the deaf interviewer departs and the informants are alone, and it is striking that whenever the signing of one informant shifts toward the signing of another, it is, with one exception, a shift from contact signing or signed English to or toward ASL. That is, informants 1A, 2A, 4A, 5A use ASL with the deaf interviewer at the beginning of the interview, and 1B, 2B, 3B, 4B, and 5B use contact signing or signed English. When the deaf interviewer departs, the latter informants switch to or toward ASL. The one exception is informant 6A, who uses ASL with the deaf interviewer and then switches to

contact signing when left alone with 6B, who continues to use contact signing. This may have occurred because, of the twelve informants, 6B is the only one who learned ASL relatively late. 6A may have switched to contact signing in an attempt to accommodate 6B. The claim that ASL is regarded as appropriate only when the interviewers are absent is further supported by the two informants (2B and 6B) who switch away from ASL to contact signing when the deaf interviewer reappears at the end of the interview. Any attempt, however, to claim that this is evidence of diglossia is quickly thwarted by the informants who use ASL in all of the interview situations, with no apparent regard for formality, familiarity, or audiological status of the cointerlocutor(s).

The patterns seen in Figure 1 provide an illustration of Giles's (1977) theory of accommodation in linguistic behavior (also, see Valli, 1988). That accommodation can take the form of convergence, nonconvergence, or divergence. With convergence, a speaker chooses a language variety that seems to fit the needs of the cointerlocutor(s). Under some conditions, however, a speaker can diverge in order to dissociate from the cointerlocutor(s), perhaps to emphasize loyalty to his group. Nonconvergence occurs when one speaker does not move away from another but simply continues using a variety that differs from other speakers. Figure 1 provides examples of all three types of accommodation. In dyad 1, for example, participant 1B converges with or shifts toward 1A when the dyad is alone. 1B then converges with the hearing interviewer by shifting to signed English, while 1A provides an example of nonconvergence with the hearing interviewer by continuing to use ASL. In all of the dyads except 6, the B participants converge toward the A participants, which is to say, toward ASL. As mentioned earlier about dyad 6, participant A may converge

toward B because B learned sign language relatively late and may not be comfortable using ASL.

A major goal of this chapter is to describe the sociolinguistic conditions that accompany the production of signing other than ASL, signing that has been labeled PSE. Contrary to claims that this kind of signing occurs in the presence of hearing people, either to aid their comprehension or to deny them access to ASL, the videotaped data in this study clearly demonstrate that contact signing is produced among deaf native ASL signers in the absence of hearing people. The sociolinguistic factors that motivate this language choice appear to include the relative formality of the interview situation and the lack of familiarity with cointerlocutors. There is clear evidence that contact signing is considered more appropriate than ASL in some situations. Furthermore, an examination of the conditions of language contact situations in the deaf community reveals that, from a sociolinguistic standpoint, these situations are not at all analogous to the sociolinguistic conditions that give rise to spoken language pidgins.

LINGUISTIC FEATURES OF CONTACT SIGNING

Another goal of this chapter is to describe some of the morphological, lexical, and syntactic features of contact signing. As explained earlier, a complete linguistic description of contact signing is planned and will be based on a corpus formed from native signer judgments of the language production on the videotapes. This linguistic description will encompass each informant's signing in all the interview situations, that is, with the deaf interviewer, with the hearing interviewer, and alone with the other informant. The present preliminary description focuses on each informant's interaction with the hearing interviewer and is

Table 5. Linguistic Features of Contact Signing

| Lexical Form | Lexical Meaning and Function | Morphological Structure | Syntactic Structure |
|--|------------------------------|--|---|
| ASL and ASL-like lexical items, English mouthing | ASL, idiosyncratic, English | Reduced ASL and English, reduction and/or absence of nonmanual signals | Reduced English idiosyncratic constructions |

based on thirty seconds of transcription per informant.⁶ From this sample, Table 5 summarizes various features of contact signing.

The lexical forms found in contact signing are ASL signs. It is important to observe that these lexical forms are consistently accompanied by the mouthing of corresponding English lexical items. This mouthing is produced without voicing. Although most of the lexical forms are ASL signs with ASL meaning and function, sometimes the lexical forms have English meanings and functions. For example, the ASL sign GROW (the sign used when discussing the growth of plants, for example) is produced with the lexicalized fingerspelled sign #UP, in a discussion of the hearing children of deaf parents. Even though the sign GROW used by our informant is an ASL sign, it is not the sign typically used in ASL for talking about the growth of children. The result, then, is the use of an ASL form with a meaning not usually associated with that sign. This example is analogous to examples in the various manual codes for English, where one ASL sign is used for a wide variety of English meanings, even though separate ASL signs exist for those meanings. For example, the ASL sign RUN (as in “run down the street”) is cited in these systems for the meanings of “run for president,” “run a business,” or “run in a stocking.” The occurrence of the sign GROW with the fingerspelled #UP may be a reflection of the signer’s exposure to manually coded systems for English in the educational system. And in a situation deemed appropriate for more English-like signing,

evidence of those systems emerges. GROW, then, is a case of an ASL sign that is not being used with its ASL meaning. In that usage it has an English meaning. Another example in the data of ASL lexical forms with English meaning and function is the sign MEAN, which in ASL is generally used as a verb, as in

wh
WORD MEAN
“What does the word mean?”

In the data, however, this sign occurs with the meaning and function of the English noun meaning, as in the sequence WHAT MEAN OF QUOTE DEAF CULTURE “what is the meaning of ‘deaf culture’”?

Both morphologically and syntactically, the contact signing examined here shows drastic reduction of both the ASL and English systems. Word order follows English patterns, as does the use of prepositional phrases, conjunctions, embedded constructions with *that*, personal pronouns, and collocations. English inflectional and derivational morphology is nonexistent, yielding a very analytic (as opposed to synthetic) picture. This extends to the mouthing of English lexical items that is a feature of contact signing. The mouthing does not include any bound English morphemes such as plural -s, third-person possessive -s, past tense -ed, and so forth.

Davis ([original volume]) draws a distinction between clear English mouthing and reduced English mouthing. The former consists of the completely silent pronunciation of a word. The latter consists of the partially

(shaking head negative) + mouthing →
 PRO-1st AGREE PRO-1st AGREE THAT BECAUSE PRO-1st SUPPORT DEAF INSTITUTION BECAUSE
 + mouthing →
 PRO-center MORE ATTENTION ON SPECIFIC #OF LIFES-T-Y-L-E AND PRO-center
 + mouthing →
 MORE GENERAL GOOD #ED DEPEND ON WHAT STATE WHICH PLACE HAVE BEST DEPEND ON
 → + mouthing →
 PEOPLE EXPERIENCE 'WELL' BACKGROUND #OF TEACHING "SO" COOPERATIVE TEAMWORK
 →
 #IS REAL MOST KEY THEIR #GOALS ETC (nodding head)

"I don't agree with that because I support deaf residential schools because they place more attention on the specifics of lifestyle and the education, in general, is better—depending on what state, which place has the best—that depends on the people's experience, on their teaching background—so, cooperative teamwork is really the key to their goals."

Figure 2. Contact signing. The transcription is relatively broad. The notation + mouthing indicates the mouthing without voice of English phrases or sentences that parallels the signed message. The term PRO is used for what appear to be pronominal forms. The gloss "WELL" indicates the placement of a discourse marker.

silent pronunciation of a word. For example, one signer fingerspells #ED “education” and mouths “educa-.” These data contain examples of both complete and partial mouthing. Furthermore, ASL inflectional and derivational morphology are virtually absent. There is also considerable use of deictic signs, such as pronouns. Finally, the contact signing yields some examples of what can only be called idiosyncratic syntactic constructions, constructions that fit neither the ASL nor the English grammatical system. Examples include sequences such as

+ mouthing →
 GROW #UP OF BE DEAF,
 and
 + mouthing →
 COOPERATIVE TEAM-
 WORK #IS REAL MOST
 KEY THEIR #GOALS.

Figure 2 provides an example of the contact signing produced by one informant in discussing whether mainstreaming is preferable to residential schools. This particular informant favors residential schools. Examples of the features of contact signing here include English word order, use of conjunctions, prepositional phrases, consistent mouthing without voice of English lexical items, idiosyncratic constructions, and the absence of determiners. Inflectional morphemes are absent except for the invented sign for English -ing and the finger-spelled copula, #is. There are also examples of deictic ASL signs (e.g., pronouns), lexicalized fingerspelling (#OF, #ED), and an ASL discourse marker (“WELL”). Finally, there is the occurrence of a single spoken English word, “so.” Recall that Woodward (1973b) and Woodward and Markowicz (1975), in their inventory of PSE features,

include English word order and the absence of determiners, two of the features of the present data. However, there are many other features in these data that are not found in their inventory.

The *linguistic* outcome of contact between ASL and English is not most aptly described as a pidgin. This observation is in accord with that of Cokely (1983). In re-viewing the preconditions defined by other researchers for the emergence of a pidgin (e.g., Ferguson and DeBose 1977), Cokely (1983, 11, 20) finds that the ASL-English contact situation

can be described as one in which members of the Deaf community communicate with hearing people in a foreigner talk register of ASL, and members of the hearing community communicate with Deaf people in a foreigner talk register of English. . . . The ASL-English contact situation does not, in fact, result in the emergence of a pidgin. Although the process of pidginization may be detected in the ASL-English situation, the preconditions for the development of a pidgin language are not adequately met. Instead the variation along the ASL-English continuum of varieties or registers can be accounted for by the dynamic interplay of foreigner talk, judgments of proficiency, and learners' attempts to master the target language—whether this is ASL for hearing users or English for Deaf users.

There is one apparent difficulty with Cokely's characterization of language contact in the deaf community. Consider an analogy from spoken language contact situations. In the contact between a native speaker of Italian, for example, and a non-native speaker, it would be quite strange to expect that the "foreigner talk" variety of Italian used by the native speaker would include any elements of the nonnative

speaker's first language. More likely, the "foreigner talk" variety would simply be a modified version of Italian. The variety of signing that the deaf native ASL signer typically uses with hearing people, however, seems to include at least some features of English and thus does not qualify strictly as "foreigner talk." This is also the case for the variety of signing that hearing people use with deaf people.

Woodward (1985, 19) describes Cokely's observations as "challenging to Woodward's (1973b) analysis of the varieties between ASL and English as a pidgin language" and contends that "by 1980, however, the notion that varieties referred to by 'PSE' as a discrete pidgin had already been abandoned." He (1985, 19) cites his own 1980 work to support this contention: "While it is true that PSE is different from pure ASL and from pure English, it is not a separate language. There is no way in the world to define where PSE begins and ends." Bochner and Albertini (1988) address the issue of PSE within the context of language acquisition and correctly observe that it is difficult to draw a clear parallel between spoken language pidgins and PSE. Although their claims are not data based, they (Bochner and Albertini 1988, 13–14) note that "a pidgin may be developing in North American schools and workplaces among users of mutually unintelligible sign systems . . . Objective and detailed descriptions of the structure and function of signing being used in these situations would clarify the picture."

To fully understand the preliminary inventory of contact signing features in these data, and to get a clearer understanding of what kind of linguistic phenomenon contact signing is, it is useful to compare it to (1) inventories of the features of English-based spoken language pidgins and (2) features of other kinds of signing such as signed English, which by its nature is English-based.

Table 6. Comparison of Linguistic Features among Various Systems

| Features | Spoken English | ASL | Signed English | Contact Signing | English-Based Spoken Language Pidgins ^a |
|------------------|----------------|-----|---|--|---|
| Lexical form | English | ASL | ASL, ASL-like signs, non-ASL-like signs, spoken English | ASL and ASL-like signs, English mouth-signing | English, some substrate, some idiosyncratic |
| Lexical function | English | ASL | English | ASL, idiosyncratic, English | Usually English, some idiosyncratic |
| Morphology | English | ASL | Reduced English and ASL, signed representation of bound morphemes | Reduced ASL and English, reduction and/or absence of non-manual signals | Reduced English |
| Syntax | English | ASL | Reduced English | Reduced English, some idiosyncratic constructions, code-switching to ASL | Basically SVO, reduced use of pronouns and prepositions, embedding rare |

^aFrom Muhlhäusler (1986).

From the comparison in Table 6, we can see that the contact signing examined thus far is distinct from both English-based spoken language pidgins and from signed English. Specifically, virtually the only way in which an analogy of contact signing with spoken language pidgins may hold is with the reduction in morphology. In all other ways, contact signing and spoken language pidgins are quite different in their inventory of features. Compared to English-based pidgins, which consist of mainly English lexical items with English meanings and functions in a reduced English morphological and syntactic system, contact signing uniquely combines ASL and ASL-like lexical items in a reduced English syntactic system.

The outcome of this language contact situation appears to be a kind of code-mixing that is quite different from those described thus far for spoken languages. For example, Bokamba (1985, 4) defines code-switching as an *intersentential* event, the embedding or mixing of words, phrases, and sentences from two codes within the same speech event and across sentence boundaries. And

code-mixing is an *intrasentential* event, the embedding or mixing of various linguistic units, that is, affixes, words, phrases, and clauses from two distinct grammatical systems or subsystems within the same sentence and the same speech situation. Kachru (1978b) and Sridhar and Sridhar (1980) offer similar definitions. Central to understanding both code-switching and code-mixing in spoken languages is that even though the parts of two different codes can be switched intersententially or mixed intrasententially, the switching or mixing is sequential in nature, as opposed to being simultaneous. That is, units in spoken languages, whether phonological, morphological, or syntactic, are necessarily produced one after the other. If, in a code-mixing situation, the verb of one language is marked with an inflection from another language, this event is also sequential, that is, first the verb is produced, followed by the inflection. It is safe to say that code-mixing, for spoken languages, does not mean the consistent use of the lexical items of one language in the syntactic system of another.

There may be some parallels to code-mixing in Whinnom's (1971) description of cocoliche, the Spanish spoken by Italian immigrants in Argentina (but not spoken by Argentines). After introducing the notion of linguistic hybridization, he (1971, 97) observes:

It is a now despised formula of "primitive" creolistics that pidgin is made up of the vocabulary of one language and the grammar of another. The observation may be faulty but it reflects a basic reality. It is, moreover, a description which fits very well certain linguistic phenomena ("secondary languages") associated with naive language learning.

At the least intense level of hybridization that he describes, Spanish lexical items (nouns, adjectives, verb radicals) are imported into an Italian morphosyntactical system without interfering with the native phonological system, a phenomenon that seems to parallel contact signing. Contact signing, however, appears to be unique in another way. In spoken language contact situations, speakers have at their disposal the phonological, morphological, syntactic, and discourse component of two or more languages, and it is possible to imagine a simultaneous mix of, say, the phonology of one language with the morphology of another, or the morphology of one with the syntax of another. It seems, however, the mixing *within* components, while possible, is necessarily sequential. That is, it seems impossible to simultaneously produce two phonological events from two different spoken languages. In the contact signing described here, however, in which a signer produces ASL lexical items on the hands and simultaneously mouths the corresponding English lexical items, the result is the simultaneous production of two separate codes. This appears to be a unique kind of code-mixing, different from what has been

described for spoken language contact situations to date.⁷

The outcome of contact between ASL and English is not entirely predictable. The outcome *could* simply be a modified form of ASL, or it could be code-switching and code-mixing of the sequential type described for spoken languages. In fact, many of the instances of sequential switching observed in the present data are distinct from contact signing. An example is the following:

| | | |
|---|--------|-----------------|
| + mouthing | —————→ | |
| THEY HAVE #KNOWLEDGE OF WHAT | | |
| DEAF CULTURE #IS ABOUT | | |
| + mouthing | ————→ | - mouthing |
| EXPOSURE TO # IT | | SEE (inflected) |
| + mouthing | ————→ | |
| NOT IDIOTS | | |
| "They have knowledge of what deaf culture | | |
| is about, exposure to it. They have seen it for | | |
| a long time. They are not idiots" | | |

In this example, the informant switches from contact signing (with mouthing of English lexical items) to an inflected form of the ASL sign SEE. This inflected form is a two-handed sign with a V handshape, produced in alternating elliptical circles away from the signer's face. It can be glossed as SEE FOR A LONG TIME. It is important to note that during the switch, the mouthing of English is interrupted and then resumed immediately following the sign.

There are also examples of simultaneous production of contact signing and ASL, such as the following:

| | |
|---|--------|
| Right hand | |
| ONE FRIEND POINT (to 1-CL on left hand) | |
| + mouthing | —————→ |
| HEARING POINT (to 1-CL) | |
| + mouthing | —————→ |
| #ADOPT BY DEAF PARENT POINT (1-CL) | |
| Left Hand: | |
| 1-CL "friend" | —————→ |
| "One friend was adopted by deaf parents." | |

In this example, the informant starts out with ONE FRIEND and then points to a classifier predicate being produced with the left hand. (l-CL is the classifier predicate produced with a l handshape.) It represents the friend in question, and the use of that predicate is a feature of ASL. The left hand shaping the l-CL stays in place while the right hand produces contact signing with mouthing of English. (#ADOPT represents finger-spelling.) That is, the left hand produces ASL, while the right hand and the mouth produce contact signing. A feature of contact signing is thus this simultaneous production of some ASL features, a phenomenon that must be distinguished from switches away from contact signing to ASL, as in the SEE example.

Contact signing is also clearly distinct from signed English, as can be seen in Table 6. Although contact signing can involve the silent mouthing of English lexical items, for example, signed English can involve spoken (voiced) English, including bound morphemes. Also, signed English can include invented, non-ASL-like signs, and bound English morphemes can be represented manually.

We observed earlier in this paper that we are reluctant at this point to call the contact signing that we have observed a *variety* or a *dialect*, that is, a discrete and consistent linguistic system. Our examination of the linguistic features of contact signing would seem to justify our reluctance. Bob Johnson (personal communication) has observed that, due to the wide variety of language skills and backgrounds and educational backgrounds that signers bring with them to language contact situations, the best way to describe the outcome of language contact in the American deaf community may be as a collection of individual grammars. Further description of our data will shed light on his observation.

SOCIOLINGUISTIC FEATURES OF CONTACT SIGNING

Sociolinguistically, the language contact situation in the deaf community also does not reflect a pidgin. It is clear that not all language contact situations result in pidginization. As Grosjean (1982, 38) succinctly summarizes this issue,

The usual outcome of bilingualism . . . is a return to monolingualism: this may take the form of maintenance of the groups' second language and the disappearance of the first language (often referred to as mother-tongue displacement or language shift); or the evolution to a new language through processes of pidginization and creolization.

In a review of the state of the art in interlinguistics, Muysken (1984) lists third-language creation, dialect shift, foreign accent, code-switching, relexification, code-mixing, and foreigner talk as possible outcomes in a language contact situation. Further, there has been continuous and vigorous debate about the fundamental nature of pidgins and pidginization at least since Hall's pioneering work in the 1960s, with DeCamp (1971), Alleyne (1971) Whinnom (1971), Bickerton (1975, 1977, 1981, 1984), Samarin (1971), Ferguson and DeBose (1977), Todd (1974), Kay and Sankoff (1974), Rickford (1981), Sankoff (1984), and Muhlhäusler (1986). However, there is apparently a basic convergence of opinion about the unique nature of pidginization in having at its inception a very particular set of sociolinguistic circumstances. As Barbag-Stoll (1983, 24) observes,

The fundamental condition for the occurrence of pidginization is a contact situation involving two or more different languages. This should by no means

imply, however, that any contact of two or more languages will result in hybridization. If the source languages are closely related, the output product is more likely to be a dialect, as the prevailing process will be substitution rather than simplification. If the spread of the source language is symmetrical when it is learnt through formal means, it is likely to result in bilingualism. Whether the output is a pidgin or a standard language depends on the degree of availability of target models and the extent to which they are exposed to the learners. If the standard language models are easily accessible and if the nature of the contact situation is such that the speaker interacts mostly with native speakers of the target language, he is most likely to learn the non-pidginized version of it. However, if the target language is spoken mainly with non-native speakers and the target models are rare, the output will most probably be pidgin.

Barbag-Stoll stresses the availability of target models and the extent to which learners are exposed to them as central to the pidginization process. Hall (1962) emphasizes that the language in question is not native to any of its users. DeCamp (1971, 15) defines a pidgin as "a contact vernacular, normally not the native language of any of its speakers. It is used in trading or in any situation requiring communication between persons who do not speak each other's native language." DeCamp goes on to say that pidgins are characterized by limited vocabularies, elimination of many grammatical devices such as number and gender, and drastic reduction of redundant features. But he cautions against equating this reduction with simplification. Bickerton (1975) states that at the inception of the pidgin-creole cycle, future pidgin speakers already have established grammars of their own and, in fact, are often multilingual. They are confronted

by the grammar of the superstrate language and then removed both from their own language communities and from the target superstrate language. In later work, Bickerton (1977, 49, 54) characterized pidginization as akin to

Second-language learning with restricted input . . . We can conclude that pidginization is a process that begins by the speaker using his native tongue and relexifying first only a few key words; that, in the earliest stages, even the few superstrate words will be thoroughly rephonologized to accord with substrate sound system and phonotactics; that subsequently, more superstrate lexicon will be acquired but may still be rephonologized to varying degrees and will be, for the most part slotted into syntactic surface structures drawn from the substrate; that even substrate syntax will be partially retained, and will alternate, apparently unpredictably, with structures imported from the superstrate.

Pidginization, then, is clearly the result of a unique kind of language contact, and the key elements in understanding the pidginization process appear to be the relative access to the target model, the lack of a mutually intelligible language among interlocutors, the immediate need for communication, and the interruption of access to one's native language.

Although one result of language contact in the American Deaf community is labeled Pidgin Sign English, the sociolinguistic situation in this community does not coincide with the "classic" pidgin situation or with any of its key elements. Let us assume, for example, that English is considered the superstrate language in the deaf community. Clearly it is the native language of hearing users of contact signing. But even deaf native ASL signers, for whom English may not be a native language, have

extensive exposure to and contact with English in various forms, first in educational settings and later in their adult lives through employment, interaction with hearing people, and through print and broadcast media. This exposure to and contact with English is accompanied by ongoing ASL interaction with other native signers. The result for such native ASL signers in American society is a maintained bilingualism, wrought from the many different kinds of contact situations occurring in the deaf community and dependent on the participants' characteristics.

Again, we see parallels with Whinnom's (1971) description of cocoliche. One reason for the occurrence of cocoliche is the resistance to full integration into the Spanish-speaking community. This invites speculation about a signer's choice of contact signing, for example, over strict signed English. Furthermore, because cocoliche represents a form of second-language learning, Whinnom points out that the speech of any two individual cocoliche speakers can never be even nearly identical. This has clear parallels with the diversity of educational backgrounds of individuals in the deaf community and what, as a consequence, they bring with them to a contact situation. But Whinnom also points out that with cocoliche, the pressures of formal language instruction do not contribute to language use. This represents an important difference with the deaf community, as the role of English in contact signing, owing directly to its role in the educational system, cannot be discounted. The present study describes some of the linguistic and sociolinguistic outcomes of language contact in the deaf community, and reveals the situation to be considerably more complex than earlier descriptions have indicated. One interesting and perhaps ironic fact about the linguistic outcome is the occurrence of English struc-

tural features in contact signing, features which do *not* include the invented signs that are part of the manual codes for English that have been implemented in the educational system. One part of the irony lies in the fact that there is considerable use in the educational system of these manual codes, and it would not be unreasonable to predict that elements of these codes would occur in bilingual contact situations. However, very little evidence of those codes was found in the data described here. Another part of the irony has to do with the generally negative reception that these codes have received from members of the deaf community (Baker and Cokely 1980). It should be clear from the present study that resistance to invented codes for English should not be mistaken for resistance to English per se, as the indigenous, natural signing that occurs as a result of the contact between bilinguals has many English features. Clearly the social stigma about invented systems does not preclude the occurrence of English features. The crucial difference is the difference between an invented representation of a language imposed on its users, and a naturally occurring form of language observed not only in deaf-hearing interaction, but also in the interaction of deaf native ASL users with each other.

Some final speculation about the future of language contact in the Deaf community: In this study, we have described the occurrence of contact signing in situations where ASL might be predicted, i.e., between deaf individuals who are native ASL users. We have suggested that the occurrence of "other than ASL" can be accounted for by a variety of sociolinguistic factors, including lack of familiarity between participants or formality of the situation. Clearly, the choice of "other than ASL" is being made in some situations; "other than ASL" is clearly seen as more appropriate in some

situations. If this were not so, native ASL users who choose ASL in some situations would use it in situations where they now choose “other than ASL.” By way of conclusion, we suggest, as have other researchers (e.g., Stokoe 1969), that the choice of “other than ASL” and the view that ASL is not appropriate for some situations are the direct results of a sociolinguistic situation in which ASL has been ignored and devalued, and in which the focus has traditionally been on the instruction and use of English. We suggest that, as ASL becomes more highly valued and becomes formally and fully recognized and used as a legitimate tool for communication in any situation, that the outcome of language contact in the American deaf community will change noticeably.

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NOTES

1. American Sign Language (ASL) is the visual-gestural language used by members of the deaf community in the United States. It is a natural language with an autonomous grammar that is quite distinct from the grammar of English. ASL is also quite distinct from artificially developed systems that attempt to encode English and can include the use of speech, ASL signs, and invented signs used to represent English morphemes. There are a number of such systems, which are often referred to by the generic term signed English.

2. Based on a preliminary examination of the linguistic and sociolinguistic data, we are reluctant at this point to call the contact signing that we have observed a *variety* or a *dialect*, and the absence of such labels in the present study is conscious. Further study may reveal the need for such a label.
3. At this point, evidence for the occurrence of signed or spoken English in the home, along with ASL, is largely anecdotal. For example, a Gallaudet undergraduate whose parents are deaf and who signs ASL as a first language remarked, in a class journal, “At first when I was born, my parents thought I was hearing due to a VERY little hearing loss. Afraid that I may have poor speech and English skills, they decided to use straight English and their voices whenever talking to me.” She later remarks that her parents went back to using ASL. And another student states, “I was introduced to ASL since I’m the daughter of deaf parents and the fifth deaf generation. When SEE [Signing Exact English, a manual code for English] was emphasized in the 70s—my mama decided to learn SEE and placed me in a mainstream program where SEE was strongly used.” Both of these comments imply the use of some form of English signing by native ASL signers in the home with their children. Furthermore, Woodward (1973c, 44) observes that, “it has been estimated that 10–20 percent of the deaf population has deaf parents. A tiny proportion of these parents are highly educated and have native English competence. In this tiny minority of the deaf, PSE [Pidgin Sign English, Woodward’s term for the outcome of language contact in the deaf community—*editor’s note*] may be learned with ASL from infancy.” However, sociolinguistic and ethnographic data to support comments and observations such as these are nonexistent.
4. The four statements introduced for discussion are as follows:
 1. Someone in a public place (airport, restaurant) discovers that you’re deaf and wants to help you. That is acceptable. Agree or disagree?
 2. The hearing children of deaf people are members of deaf culture. Agree or disagree?
 3. Gallaudet University should have a deaf president. Agree or disagree?
 4. Mainstreaming is better than residential schools. Agree or disagree?
5. At this stage of the study, assessment of the signing on the tapes (i.e., ASL vs. other-than-ASL vs. signed English) is based on the judgment of the researchers. ASL and other-than-ASL were judged by a deaf native signer; signed English consistently included the use of voice and hence included input from the hearing researcher. The final analysis, however, will not be limited to the judgment of the researchers. The second part of the data

- collection will consist of having native signers view each tape at least twice and indicate by pushing a button when switches away from ASL or back to ASL take place. These native-signer judges will be asked to characterize the language production between the switch points, and it is this production that will form the data base for the eventual description of contact signing. The entire methodology was first designed and employed by Robert E. Johnson, Scott Liddell, Carol Erting, and Dave Knight in a pilot project entitled "Sign Language and Variation in Context," sponsored by the Gallaudet Research Institute. The data base will eventually include the signing production of twenty individuals: twelve white and eight black. The sign production of the black informants reflects their interaction with both black and white, and hearing and deaf, interviewers.
6. These thirty seconds of data per informant were transcribed by a deaf native signer. The transcription process was as follows: after a shift to contact

signing was perceived by the transcriber, thirty seconds were allowed to elapse and then the next thirty seconds were transcribed. This transcription procedure was followed for all twelve informants.

7. The situation is somewhat analogous to the one described by Gumperz and Wilson (1971, 155) as convergence, where he claims that a single syntactic surface structure is the result of the extended contact between three languages. The outcome of the ASL-English situation is different, however, in that its basic syntactic structure is English. It should be noted that in spoken language contact, there could conceivably exist a simultaneous mixing of features within a single phonological segment, and it is this kind of mixing that probably accounts for certain kinds of accents. Our data are different, however, in that we see the simultaneous production of two complete segments (as opposed to features of segments) from two distinct phonologies, each segment retaining its integrity.

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