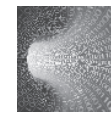

Article

new media & society
2016, Vol. 18(11) 2507–2523

DOI: 10.1177/1461444815594441
nms.sagepub.com

Autism and new media: Disability between technology and society

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Abstract

This article explores the elective affinities between autism and new media. Autistic spectrum disorder (ASD) provides a uniquely apt case for considering the conceptual link between mental disability and media technology. Tracing the history of the disorder through its various media connections and connotations, we propose a narrative of the transition from impaired sociability in person to fluent social media by network. New media introduce new affordances for people with ASD: The Internet provides habitat free of the burdens of face-to-face encounters, high-tech industry fares well with the purported special abilities of those with Asperger's syndrome, and digital technology offers a rich metaphorical depository for the condition as a whole. Running throughout is a gender bias that brings communication and technology into the fray of biology versus culture. Autism invites us to rethink our assumptions about communication in the digital age, accounting for both the pains and possibilities it entails.

Keywords

Asperger's syndrome, autism (ASD), computer-mediated communication, disability studies, gender and technology, interaction and technology, new media

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Introduction

The history of modern mental pathology is in part the history of the lived experience of technical media. Paranoia, hysteria, aphasia, hyperactivity disorder, attention deficient disorder, posttraumatic stress disorder, schizophrenia, and autism all have suggestive media parallels not only for media theorists but also for patients and doctors. Friedrich Kittler (1999) showed how late 19th-century psychiatry, psychoanalysis, and neurology made the brain and its malfunctions present through and as optical, acoustic, and graphic media. He was also keen to observe how media, understood as externalized body assists, created new abilities and new disabilities: The typewriter was designed to aid the blind but ended up reversing the gender of writing, and the telephone was designed to aid the deaf but ended up at the heart of 20th century signal processing. Kittler's point is that access to the depths of the human psyche and sensorium is always historical, and our reflexive awareness of what Sigmund Freud called "the psychic apparatus" has been deeply shaped by media devices of all kinds. Pathology not only reveals normality, as the doctors have always said, but it also reveals technology.

In this article, we explore the elective affinities between autism and new media. Tracing the history of the disorder through its various media connections and connotations, we propose that the media story of people with autistic spectrum disorder (ASD)—the most neutral label amid a swarm of names—is that of the transition from impaired sociability in person to fluent social media by network. Whereas decades of thought about mass media posited face-to-face conversation as the communicative ideal, autism presents an alternate mode of texting, typing, and mediated talk stripped of both verbal and nonverbal complexities. New media have introduced new affordances for people with a disability commonly referred to as a "pervasive communication disorder." Indeed, autistics are often said to be the fittest to cope with the strains of the new media age, a view common among autism activists themselves. Autism thus presents an apt case for considering the ways disability plays into the relation between technology and society with consequences far beyond those affected by the disability.

The link with new media is also revealing of the changing social status of people with ASD: a case in point are recent labor trends in the high-tech industry, which favor the purported special abilities of the high-functioning, especially with Asperger's syndrome. At the same time, being "on the spectrum" is a badge openly worn by hackers and other digital activists, sometimes to earn praise, other times pardon. Throughout this cultural formation is a consistent gender bias that brings communication and technology into the fray of biology versus culture. Autism invites us to rethink our assumptions about communication in the digital age, and in doing so to account for both the pains and possibilities of disability.

Autism has a complicated social and intellectual history. It is many things: a domain of research, a genetic predisposition, a cultural trope, a hell for exhausted parents, a body of psychiatric knowledge, a self-declared identity, a small library of memoirs, a hot-bed of pet theories, and a cast of characters including the so-called refrigerator-mothers, Martians and machines. Few subjects have called forth so much talk, research, and misery in recent years. Whatever else it is, autism reflects the general condition in which interpersonal relations have become increasingly mediated by devices. Our concern in

this essay is not the etiology or ontology of autism but rather its cultural echo as a set of discourses that comment on recent changes in the technological infrastructure of communication and the proliferating use of digital platforms for relational purposes. In this regard, a running comparison with schizophrenia will be instructive, an illness with which it shares a long diagnostic history. If schizophrenia can be characterized as an excessive intrusion of the social, with its intrusive voices and broadcast thoughts, autism can be characterized as an extreme withdrawal from the social in favor of a persistently impersonal, and often narrowly technical, world. Autism and schizophrenia may well be described as the paired mental disabilities of the communication age.

Mental disability presents complex methodological and analytical problems. For starters, some advocates deny that there is anything wrong with autism, and see its stigma as a power-play by the dominant class of "neurotypicals" (Singer, 1999). Disability studies amplify this view in advocating that disability should move "from the realm of medicine into that of political minorities" (Garland Thomson, 1997: 6) or casting it as the missing term in the dominance triad of gender, class and race (Davis, 1995). Since the 1960s, the anti-psychiatry movement has blamed medicine as oppressing and stigmatizing minorities. Arguably, in no other medical domain is social construction so evident as in psychiatry, an observational science whose necessary reliance on both behavioral criteria and self-reports make patient and doctor into collaborators. Ian Hacking's (1986) notion of "dynamic nominalism" shows how psychiatric diagnoses are not simply descriptive categories but active instruments that call new kinds of subjects into being.

But Hacking does not dismiss organic causes of mental illness either. We follow him and Bruno Latour (1993) in recognizing social construction without dismissing biological facticity, and seek to acknowledge the lived, embodied experience of people with disabilities (Siebers, 2008). Only by maintaining this complex position can we resist both the biologization of contingent cultural assumptions *and* the idea that mental illness is completely cultural. While the former risks ontologizing metaphors, the latter risks denying the lived misery of mental disease. In this respect, autism is both a construct and a real medical condition.

Disability also illustrates the dialectics of handicap: the ways that a deficit, in some (rare) cases, can also serve as a creative advantage. Disability defamiliarizes the taken-for-granted and thus calls for possible correctives. For this reason, madness has sometimes held huge prestige among modernist innovators since the late 19th century (Sass, 1994). The "mad" have changed the ways we see and think through painting, literature, and philosophy. In media history, the "disabled" often get there first and reveal the metaphysical possibilities of new devices. As Jean Baudrillard (1988) observed, "a handicap opens up a veritable terrain of anticipation, a sort of objective experimentation on the body" (p. 51). Media sit at the switch between disability and ability, a spot of fierce contestation.

That the many may profit from the disability of the few creates ethical quandaries. Disability can have a certain envious glamor and contagion once it returns to infect the normal which once defined it as lacking. Exclusion can inspire innovations that reach far and wide. Yet as minorities feedback experience into the ocean of normalcy (e.g. as all users of social media might now be seen to take on somewhat autistic characteristics), the pain that yielded the insight might be forgotten. Critical scholars have taught us a lot

about the lure of the other, the exoticizing pull of alternate forms of being, and there is a similar kind of problematic autism chic today, as we will see. The story of autism and new media provides a lesson in social epistemology: the ways in which the social itself is discovered and becomes known—through media—by those previously excluded from the social.

Historical media formations: autism and schizophrenia

Exploring present-day connections between autism and new media requires consideration of the history of the condition, and in particular its evolution as the dialectical partner of schizophrenia. As we show, technology has importantly informed the understanding of these two interconnected conditions. Schizophrenia, first defined as a distinct condition in 1896, was a disease made manifest through electrical media and their metaphors. As its discoverer German psychiatrist Emil Kraepelin (1899) noted, the condition was marked by "perception of voices in one's own body, living dreams … the ill are inclined to the reception of magical, magnetic, electrical, physical, hypnotic actions at a distance, which are transmitted by all sorts of machines, telephones, galvanic batteries" (pp. 73–174; author translation). Schizophrenia, a disease celebrated by a wide array of 20th-century theorists and experienced as a crippling misery by many more, has been consistently expressed in metaphors drawn from mass media, especially radio and TV, to the point that "thought broadcasting" (the experience that one's thoughts leak out for all to hear) has become a first-rank symptom of the illness. Schizophrenia has an elective affinity with broadcasting: both enact a structure of address that scrambles the line between private and public (Peters, 2010).

The Swiss psychiatrist Eugen Bleuler, who gave schizophrenia its official name in 1908, also coined the term *Autismus* (as well as the term "ambivalence"). In fin-de-siècle psychiatry and psychoanalysis, autism first referred to sexual self-absorption. Havelock Ellis used the term "auto-erotism" in 1898 to describe the condition in which there is no external object of pleasure besides one's own body, which Freud took up as "Autoerotismus." Bleuler, who was less committed to sexuality as an explanatory category, used "Autismus" instead, launching the term on its long journey in 1910. From the Greek "autos" or self, *Autismus* named the symptom of turning radically away from the external world and its substitution by inner fantasy totally indecipherable to outsiders: "schizophrenics who have no more contact with the outside world, live in a world of their own … they have cut themselves off as much as possible from any contact with the external world" (Bleuler quoted in Parnas et al., 2002: 131). For Bleuler, *Autismus* meant self-enclosure against all kinds of reality, not only social reality, as the later definition would have it.

Notwithstanding these and other precursors (see Wing, 1997), the decisive turn came in the 1940s, when autism was clearly demarcated from schizophrenia. In a case of independent scientific discovery, two psychiatrists of Austrian origin working on two different continents in two countries then at war revised Bleuler's definition without knowledge of each other: Leo Kanner in 1943, and Hans Asperger in 1944.

Kanner's report of 11 children examined in his clinic at Johns Hopkins University identified three major characteristics: social detachment, impaired language, and insistence on

sameness. "There is from the start an *extreme autistic aloneness*," states Kanner (1943), "that, whenever possible, disregards, ignores, shuts out, anything that comes to the child from the outside" (p. 242). Kanner associated such "disturbances of affective contact" with a non-social, nonreciprocal, use of words marked by echolalia, extreme literalness, perception of parts instead of wholes, and extraordinary rote memory. "Thus, from the start, language—which the children did not use for the purpose of communication—was deflected in a considerable measure to a self-sufficient, semantically and conversationally valueless or grossly distorted memory exercise" (p. 243). The children had trouble switching between the positions of "you" and "I" so basic to turn-taking dialogue, and also seemed to prefer objects to people: "Every one of the children upon entering the office, immediately went after blocks, toys, or other objects, without paying the least attention to the persons present" (p. 246). Objects supplied what people could not: predictability and monotony. Kanner portrayed his patients as having a uniform modus vivendi, relating to everything and everyone equivalently—as objects.

Asperger, a name now synonymous with high-functioning autism, published his *Habilitationschrift* on "autistic psychopaths," a term that has receded for obvious reasons, only a year after Kanner, but it was not before 1981 that it first appeared in English (though professionals, including Kanner, knew about it earlier). Kanner's work had immediate impact, but Asperger's name is the one now remembered. His report bears many similarities with Kanner's, noting a comparable type of social detachment: "'autists' have severely disturbed and considerably limited interaction. The autist is only himself … and is not an active member of a greater organism" (Asperger, 1991: 38). "Failure of community" [*Versagen an der Gemeinschaft*] is a core feature. His patients showed an inability to understand jokes and humor. Asperger also described a peculiar, "unnatural," use of language that is "not directed to the addressee but is often spoken as if into empty space" (p. 70). Yet, it is precisely social detachment that is "responsible for their good intellectual grasp of the world" and for special abilities in mathematics, natural sciences and "complex machinery" (pp. 74, 72). "To put it bluntly," states Asperger, "these individuals are intelligent automata." Any hope for social interaction would have "to proceed via the intellect" (p. 58).

For both Asperger and Kanner, autism was chiefly characterized by a "disturbance of contact," a phrase strikingly used by both (*Kontaktstörung* is Asperger's term). This disturbance, however, does not necessarily mean a complete disconnection from the outside, but rather a restrictive and involuntary contact, a way of living alongside rather than in the world. Asperger's patients had trouble with reading eye movements, gestures, mimicry, tone of voice, motoric expression, and other forms of what we now call nonverbal communication. Both Kanner and Asperger were careful to distinguish this new syndrome from schizophrenia. Autism remained constant throughout development almost like a personality feature whereas schizophrenia could flare up suddenly. Autism also had a clear gender dimension, and though each physician had some girls among their cases, the majority were boys. As Asperger (1991) said, "In general abstraction is congenial to male thought processes, while female thought processes draw more strongly on feelings and instincts" (p. 85). Autism has always been a meditation not only on communication dysfunction but also on how this dysfunction correlates with gender roles (Pinchevski, 2011).

What brought about such radical inwardness and preference for the asocial thing-world? Trauma was the mid-century explanation. Bruno Bettelheim gave the most extreme version of this account. He published a case history about a 9-year-old autistic boy who believed his body was a machine. "To do justice to Joey," writes Bettelheim (1959), "I would have to compare him simultaneously to a most inept infant and a highly complex piece of machinery" (p. 117). As Bettelheim recounts, Joey would plug himself to an imaginary outlet before he could do anything: entering the dining room, he would string the table to an "energy source," insulate himself with paper napkins, and then plug himself in before proceeding to eat. Joey also produced magnificent drawings where he is seen connected to various apparatuses. To Bettelheim, all this looked like "an electrical 'papoose', completely enclosed, suspended in empty space and operated by wireless signals" (p. 118). Bettelheim reasoned that Joey replaced connection with his mother, who had rejected him, with an alternative source of energy, creating "machines to run his body and mind because it was too painful to be human" (p. 120). His conclusion was damning: Joey's autism came because "his despair that anybody could like him made contact impossible" (p. 122). This point mixed postwar existentialism with his professed allegiance to John Dewey's democratic interactionism (Bettelheim, 1960: 40). A boy that functions like a machine was a symbol of the pains of postwar mass society: "our society of mechanized plenty often makes for equal difficulties in a child's learning to relate" (Bettelheim, 1959: 122).

Bettelheim's etiology of autism now seems outlandish, if not cruel. Yet, the portrayal of the person with ASD as cyborgs *avant la lettre* interestingly corresponds with some of the characteristics noted by both Kanner and Asperger. All three draw a dichotomy between the social and the technical, deeming them irreconcilable—benevolently as in Asperger, malevolently as in Bettelheim, with Kanner somewhere in-between, but slouching toward Bettelheim. Kanner noted that many of his patients lacked "warm-hearted parents," and gave the so-called "refrigerator mother" hypothesis (the lay terminology for the view that maternal coldness is the disorder's cause) a boost with his comment in a 1960 *Time Magazine* (1960) interview that the mothers of autistic children just happened to "defrost enough to produce a child" (p. 78). Still it was Bettelheim who cemented this view by literally equating parents with prison guards, a subject of much posthumous cringing.

One of the first to contest Bettelheim's unforgiving account was Bernard Rimland, whose 1964 book *Infantile Autism* shifted the condition from nurture to nature. A Navy psychologist specializing in psychometrics and a father to an autistic boy, Rimland trespassed into neurobiology to offer what was then a rather speculative explanation (Eyal, 2010: 173–174). His theory was of an organic disorder that could be described as a dysfunction in the brain's sensation and memory mechanisms, a view that prefigures today's understanding. A key reference in Rimland's study was Claude Shannon's mathematical theory of communication. Rimland understood Shannon to say "there is a trade-off of fidelity of information processing for conceptual breadth" (Rimland, 1990: 3). He described autism as a condition of high fidelity and narrow bandwidth, whereas schizophrenia, by contrast, was a condition of broad bandwidth and low fidelity. Autistic children were found to be "underassociating," their high fidelity transmission eliciting "highly stimulus-specific responses," whereas schizophrenic children were found "overassociating," their excessive

stimulation eliciting "so many responses that disorganization would result" (Rimland, 1964: 201–202). The pathological circuitry of the autistic mind lay in processing and storage; that of the schizophrenic mind, input and output.

Rimland would later serve as an advisor to the multiple Oscar-winning Hollywood film *Rain Man* (1988), providing Dustin Hoffman with reading material and educational films to prepare for the part of Raymond, an "autistic savant" (a term coined by a colleague of Rimland). One can hear Rimland's vision of autism in a dialogue between Tom Cruise's character and Raymond's doctor. To the question of what autism means, the doctor answers, "It means that there's a disability that impairs sensory input and how it's processed … Raymond has a problem communicating and learning. He can't even express himself or probably even understand his own emotions in a traditional way." In a note after the film, Rimland offers this concise description: "His reality is of a different sort—one we can rarely, and fleetingly, enter. His skills are those achieved by the computer, the tape recorder, and the camera—devices which process data precisely and without distraction" (Rimland, 1990: 3). These media metaphors bring together the storage and processing functions in underscoring the restricted and repetitive manner in which the "autistic savant" is said to interact. *Rain Man* played a key role in popularizing autism, though Raymond is unrepresentative—only 1 of 10 have such extraordinary gifts.

By the 1970s, the technical metaphors explored by Rimland were becoming pervasive in autism research, in line with the expansion of cognitive and neurosciences (see Rose and Abi-Rached, 2013). One study suggested that the autistic's insistence on sameness "may be indicating that material (or input) had streamed in, but that he cannot do anything with it. It remains digital—stored as datum without any instructions (meta-information)" (Kahn and Arbib, 1971: 315). Viewing the brain as an information-processing device, and feelings as information "albeit of an analog type," the authors (disciples of the father of cybernetics, Norbert Wiener) treated autism as a hardware malfunction of "wiring, circuitry, dampers, or unmodified aspects of the overall program" (p. 307). The autistic lacked the ability to handle meta-level information and was therefore fixated on the concrete: "He has a still photo for a cognitive map rather than a motion picture" (p. 315). There is a clear allusion here to Gregory Bateson (1972), who in the early 1950s described schizophrenia as an inability to sort out the digital or message level from the analog or meta-message level. (Nonverbal communication is the heartland of such meta-messages). If schizophrenia is characterized by what Bateson called "double-bind" (a conflict between the two levels), autism may be characterized as a no-bind, as a total disconnect between the levels. Understood cybernetically, autism and schizophrenia are twinned disabilities of the meta-communication system, the former being negative feedback run rampant, the latter being positive feedback gone awry. And with these speculations, the brain itself becomes a new kind of media apparatus, both embodying and reflecting the various computational functions by which it has been approached.

The social and the technical

The correlation between psychiatry and technology in the case of autism does not end in the 1970s but in fact has developed with even greater intensity since then. Autism has

settled into a more or less stable definition in recent years. At the core lie deficits in social interaction, a preference for repetitive patterns, and narrow interests. Psychologist Uta Frith (2008) summarizes, "The hallmark of autism [is] the lack of reciprocal social interaction" (p. 107). It is a neurodevelopmental disorder and more common among men: four boys are diagnosed with autism to every girl, and nine boys to one girl with Asperger's or high-functioning autism—a gender difference that translates into both mental and occupational biases, as we note shortly. People with ASD are said to lack a "theory of mind," not put themselves in others' shoes, and have deficits of social empathy. Cambridge psychologist Simon Baron-Cohen (1995) calls this condition "mind-blindness." The spontaneous sharing of feelings through nonverbal cues is largely absent; even yawning seems less contagious among people with ASD (Senju et al., 2007). A consistent theme seems to run across clinical and cultural discourses: the divide between the normal and the autistic is typically described as that between the social and the technical. If the social is the world of emotion, intimacy, and contact, the technical is the world of reason, detachment, and remoteness; if the former is the world of the normal, the latter is that of the autistic.

The emerging understanding of autism in the last two decades can be summarized thus: "It's the wiring, stupid" (Blume, 1997a). The closer we move to the present, the more computer technology becomes the principle explanatory metaphor for the human mind—and its pathologies. Though philosophical debates on computer intelligence remain open (see Dreyfus, 1992) psychiatry and psychology of the cognitive science brand seem to have transcended the quandary by embracing computers as the model of mind, based on the irresistible resemblance between computational and neurological processes. This analogy affords various affordances, not least when it comes to a wide range of psychopathological conditions, including autism. The current understanding of autism, as noted, rejects psychogenesis in favor of genetics. Yet the trope of the technical versus the social, which accompanied autism from its inception, not only survived the changing etiology but has now become its leitmotif.

According to Baron-Cohen (2003), autism is an extreme case of the male brain, which might explain why it is more frequent in boys. This theory stipulates that the male brain is predisposed to "systemizing" (i.e. exploring and constructing systems), whereas the female brain is predisposed to "empathizing" (i.e. understanding and responding to others' emotions). Autism is a pathology of over-systemizing and under-empathizing: on the one hand, attachment to rules, classifications and details which can be controlled and predicated; on the other hand, inability to relate to others, to "mind read" their emotional state, and respond adequately. Put succinctly, "Present them with a system and they seek to spot the underlying factual regularities … Present them with some speculation about what someone might think or feel, or with a topic that is ultimately not factual, and they switch off …" (p. 134) Here, it is hard to sort out where cultural-technical stereotypes end and neuroscience begins.

The next phase of this theory is even more explicit. Research shows a higher occurrence of autism in families where the father and grandfather are scientists or engineers. According to Baron-Cohen (2012), this is not a coincidence, as "the genes responsible for autism [may] persist, generation after generation, because they are co-inherited with genes underlying certain cognitive talents common to both people with autism and

technical-minded people whom some might call geeks" (p. 74). "Geeks," although not fully manifesting the syndrome themselves, are more likely to produce children expressing recessive traits when they pair up with fellow geeks. This "assortative mating" theory, as Baron-Cohen calls it, might account for the purportedly high rates of autism (specifically Asperger's) around high-tech centers where "systemizers" gather, such as Silicon Valley in California, Bangalore (the Indian equivalent), and Eindhoven (the Dutch equivalent, where Baron-Cohen conducted research). Technology becomes a factor in, not only a feature of, this disability. A new chapter in the short history of the link between autism and technology is now beginning, as biological and technological evolution interdigitate.

If in the past it was the diagnosticians who described autism through technological themes, nowadays people with ASD have embraced the tendency themselves. Consider how autistic celebrity and advocate Temple Grandin (1995) describes her mind: "I translate both spoken and written words into full-color movies, complete with sound, which run like a VCR tape in my head" (p. 19). She has also said her mind works like a search engine that only finds images:

> When I am talking about something for the first time, I look at the visual images on the "computer monitor" in my imagination, then the language part of me describes those images. After I have given the lecture several times, the new material in language is switched over into "audio tape-recording files." When I was in high school, other kids called me "tape recorder." (Grandin, 2000)

There is nothing to suggest alienation from technology in this description—to the contrary: It is by technologizing herself that Grandin has recourse to other humans.

Grandin further demonstrates an alliance with the technical through an idiosyncratic contraption she devised—a "squeeze machine." As she tells Oliver Sacks, as a little girl she "had longed to be hugged but had at the same time been terrified of all contact" (Sacks, 1995: 263). She soon constructed a body-sized machine capable of administering just the right pressure and duration of the "hug" desired. The machine became a significant support in her life: "She could not turn to human beings for solace and comfort, but she could always turn to it" (p. 263). She then realized that the squeeze machine could be useful for other purposes. Having spent her childhood on a farm, and feeling herself closer to animals than to humans, Grandin developed holding chutes for handling cattle that work very much like her own personal "hugging machine." As she explains, "Cattle are disturbed by the same sorts of sounds as autistic people—high pitched sounds, air hissing, or sudden loud noises; they cannot adapt to these" (p. 265). (This insight made Grandin a leading consultant in slaughterhouse design). Animals and machines are Grandin's true allies; among human she feels, as Sacks' title reads, like an "anthropologist on Mars." For people with ASD, human relations are foreign relations. Grandin, much like Bettelheim's Joey, seeks relief in the company of nonhumans. Her world is made habitable by technologizing the social, by letting machines, rather than people, do the hugging.

Douglas Coupland, author of *Generation X* among other books, was one of the first to link autism and technoculture. Frequently referring to himself as having a mild case of Asperger's (Blincoe, 2004), Coupland's (1995) novel *Microserfs* is about a group of

programmers working on the Microsoft campus and living in a "geek house." One of them locks himself in his office for months as a latter-day Bartleby, living off a two-dimensional diet: food that could be slipped underneath the door. When his mother suspects that he might be autistic, a co-worker retorts, "I think all tech people are slightly autistic … Autism's a good way of focusing out the world to exclude everything but the work at hand" (Coupland, 1995: 159). Coupland's (2006) *JPod*, a post-dot-com bubble novel of six videogame programmers, is rich with what one of the characters calls "microautism": a condition which "seems to favour people in tech and computer industries" (p. 292). "I have come to the conclusion," states the narrator, "that my co-workers aren't so much idiots as they are fellow citizens in the thrall of various modes of persistent low-grade autism" (p. 290). One co-worker is described as a textbook Asperger's, "ideally suited to the coding universe"; another is keen to build a contraption identical to Temple Grandin's: "We could be the world's first tech company with its own hug machine" (pp. 290–291, 185). The high-tech industry is here portrayed as a hothouse for high-functioning autistics: socially forgiving yet technologically demanding.

Coupland's recent biography of fellow Canadian Marshall McLuhan carries the theme of autism to nonfiction, pointing out an ostensibly abstracted demeanor that might place McLuhan on the autistic spectrum. For Coupland (2010) McLuhan's reported hypersensitivity to noises, his love of ritual and dislike of disruptions in daily routine, avoidance of touch, obsessive memorization, interpersonal obliviousness, and tuning out in conversations all tell of an autistic tendency. Coupland even attaches a full-length Autism-Spectrum Quotient (AQ) Test devised by Baron-Cohen, inviting readers to score the biographee. "This is not to say that Marshall was autistic, or even a high-functioning Asperger syndrome autistic. But if he had any specific psychopathology, that would be the direction in which to look" (p. 50). Whether this diagnosis holds is of less importance than the association of the prophet of the information age with autistic tendencies. A mildly autistic McLuhan can only be the brainchild of contemporary digital culture.

Lay diagnosis is often wrongheaded, but as a cultural trope it is instructive. It is something of a recent fad to identify autistic traits (Asperger's in particular) in famous people, living, dead, or even fictional. A quick Google search reveals the following names: Isaac Newton, Thomas Edison, Nikola Tesla, Albert Einstein, Alan Turing, Glenn Gould, Ludwig Wittgenstein, Bill Gates, Steve Jobs, and Mark Zuckerberg. Fictional characters include Bartleby the Scrivener, Henry Higgins, Mr. Spock, Sherlock Holmes, Chauncey Gardiner, Tommy the "pinball wizard," Mr. Bean, Dr. Who, and *Big Bang Theory*'s Sheldon Cooper. However flippant, the lay perspective confers some crowd wisdom: all characters seem to combine social ineptness with acute mental abilities of a specialized technical kind, and the vast majority are male. If these names are any indication, the popular image of autism is clearly skewed toward the Asperger's part of the spectrum, neglecting the wide margins of the less glamorous, less functional, and more miserable variants. But there is a silver lining: to recast exceptional figures as autistic is to celebrate their quirkiness rather than to disparage it. As with other marginalized groups, the mark of Cain might turn—not without a struggle—into a banner. This is no doubt thanks to hard work by disability rights movements, which brought changes both to legislation and to popular culture representations. If today we speak of "Aspie pride" and "geek chic," it

is owing to a transformation in how the disability is viewed first and foremost by people with ASD themselves.

The Internet as autistic habitat

The Internet and the associated new media have introduced new opportunities to people with various disabilities (Ellcessor, 2010; Ellis and Kent, 2011; Goggin and Newell, 2003; Haller, 2010); the transformation made possible thereby for people with ASD cannot be overstated. In a 1997 article in *The New York Times*, Harvey Blume (1997b) reported on a recent phenomenon: "In cyberspace, many of the nation's autistics are doing the very thing the syndrome supposedly deters them from doing—communicating—often in celebration of the medium that enables them to do so." One person with ASD is quoted as stating, "Long live the Internet. People can see the real me, not just how I interact superficially with other people." The article was one of the first to popularize a new vocabulary—and a new politics—emerging from such on-line platforms: the formation of a communal autistic identity distinctive from "neurologically typical people—or 'NT's' in the community's parlance" (Blume, 1997b). The Internet was the *conditio sine qua non* for the ASD community, a medium that opened up new opportunities for exchange while freeing them from the ambiguity and sensory overload of the face-to-face. Online communication provided a way around autism's "triad of impairments": communication, interaction, and imagination (Frith, 2008: 22). It was as though the Turing Test were to be reenacted on a large scale, banishing all forms of communication except for typed text. The test itself is an image of what its designer (a posthumous Aspie) considered an ideal for his own life: "he would be left alone in a room of his own, to deal with the outside world solely by rational argument" (Hodges, 1983: 425). These early navigators of cyberspace had social inhibition as wind in their sails.

If autism is an atypical neural wiring—as opposed to the neurotypical configuration—it is a minority, not disability, with more in common with race and sex than with psychopathology. This view adds a new twist to the social construction-versus-hard science debate, as it draws profitably on both sides of the equation, making a case for the "complex embodiment" of the lived experience of disability (Siebers, 2008). As one of the first autism rights advocates, Jim Sinclair (1993), puts it, "Autism isn't something a person *has*, or a 'shell' that a person is trapped inside … Autism is a way of being." The wiring imagery goes all the way from the brain to the web (two realms crucially shaped by cybernetics): the web itself can be seen as a complementary extrasomatic wiring system that compensates for offline incompatibilities—a digital papoose. The convergence of bits and neurons, neurology and cybersurfing, proved twice liberating for people with ASD: both as a metaphor for a distinctive biological condition and as an assistive platform by which autistics discover themselves socially.

The term *neurodiversity* was coined in the late 1990s by autism advocate Judy Singer (apparently in her Honors Thesis at the University of Technology, Sydney), and first popularized by Blume in the aforementioned article. As she (Singer, 1998) argues, "The 'Neurologically Different' represent a new addition to the familiar political categories of class/gender/race and will augment the insights of the Social Model of Disability. The rise of Neurodiversity takes postmodern fragmentation one step further" (p. 11), a

condition she obviously supports. Neurodiversity has recently broadened to include ADHA, dyslexia, Tourette syndrome, and even schizophrenia in an expansive "mad lib" movement, and has shaped diverse domains such as autistic advocacy networks, popular culture, and research in psychology and psychiatry. Its challenge is to question not only the social construction of disability but the very mechanisms by which social construction operates: how we sense, feel, touch, and communicate. Some even go as far as claiming that neurodiversity is as important to human evolution as natural selection (Armstrong, 2010: 17). As Temple Grandin, obviously an avid neurodiversity advocate, has recently stated, "Some guy with high-functioning Asperger's developed the first stone spear; it wasn't developed by the social ones yakking around the campfire" (quoted in Solomon, 2008). She suggests an alternative history to be written of the systemizers, the socializers' under-acknowledged partners in human evolution.

Early observers often likened the Internet to assistive devices for the visually and audibly impaired. As Singer (1999): claims, "The development of AS identity owes much to the Deaf movement, whether consciously or through a 'trickle-down' effect" (p. 67). Elsewhere she adds, "Autistics compare the importance to them of computers with the importance of seeing-eye dogs to the blind" (Singer, 1998: 41). Blume joins her in comparing the Internet to "the spread of sign language among the deaf" (quoted in Singer, 1999: 67). Elsewhere he states, "for many autistics the Internet is Braille" (Blume, 1997a). A comprehensive comparison with the challenges of sensory disabilities is beyond the scope of this article (see Mills, 2011; Sterne, 2003) but suffice it here to note that Braille and sign language are alternative codes that compensate for one sense with the other, and thus remain largely exclusive to the impaired. The Internet, however, is at the service of both Aspies and NTs, and is therefore more like the telephone and the typewriter, in being designed for a minority but quickly adopted by all. But unlike the common use of these two veteran technologies, which ended up leaving the handicapped twice removed from social communication, the Internet in this narrative produces greater inclusion. As Hacking argues, the Internet helps people with ASD communicate more like neurologically typicals (NTs) and NTs more like people with ASD (Hacking, 2010: 653). Online communication can be autistically social or socially autistic, depending on the observer. Either way, the Internet offers a platform for rapprochement between the two sides of the disability, counterbalancing mental capabilities and technological affordances. Here, again, we see the mainstreaming of minority experience.

But there is also a darker side to the story of ASD and Information Technology. Pathology has a political economy. The classification into high- and low-functioning autism is already a class distinction. Indeed, the very notion of functionality in this context should be problematized. The high-tech economy puts a premium on the high-functioning—sometimes even more than the equivalent NT—and has no use for the so-called low-functioning. People with ASD are perhaps the most economically polarized minority, with start-uppers on one extreme and lifetime dependency on the other. From this perspective, recent talk about the "autism spectrum" and "autism cluster" can sound uninformed: at the two ends are two different worlds. It is heartrending to hear parents talk about their peer dynamics: those with high-functioning kids envy parents with normal kids; those with low-functioning kids envy parents of high-functioning ones. In the digital age, Asperger's syndrome might carry just enough cultural capital to compete

with NTs on their own turf. But the vast majority of people with ASD are marooned, something that both distresses health-care providers who work with the low-functioning and mirrors the vast inequalities in global resources today. Recent discussions rarely consider the class angle of this disability, a lacuna hopefully to be rectified in future studies.

For the high-tech industry, the high-functioning autistic would make the perfect worker: tied to the computer without distractions, lacking social life, obsessive about details and routines, and averse to chitchat and conflict. This is indeed the bleak portrait of Aspies at the service of Silicon Valley conglomerates portrayed by Coupland. An alternative can be found in the Danish company *Specialisterne* ("Specialists") that employs autistics for services such as software checking and data-entry while providing its workers with an ASD-friendly working environment. "We harness the special characteristics and talents of people with autism and use them as a competitive advantage," says the company's banner. An American version is the startup *Aspiritech* (a play on "Asperger's," "spirit," and "technology"), which exclusively hires people with Asperger's or high-functioning autism as program testers. "Engineered for testing" is one of the company's mottos, leaving open whether it is the products or the people that are engineered. These companies, though exceptional, exemplify two interconnected developments: the growing presence of people with ASD in the high-tech business and the rise of autistic identity and autistic rights movements.

But the story of people with autism and new media is not only one of high-tech conformists. In fact, some of the most ardent rebels against the system are loners armed with keyboards. This type of digital activism was recently named "the weapons of the geek": "a modality of politics exercised by a class of privileged and visible actors who often lie at the center of economic life" (Coleman, 2014: 107). Hacker culture is replete with figures sporting autistic traits. Julian Assange, the founder of WikiLeaks who started out as a programmer and hacker, states in his autobiography: "I am—all hackers are, and I would argue all men are—a little bit autistic" (Assange, 2011: 67). Gary McKinnon, a British system administrator, was caught in 2002 and charged for hacking into numerous US government computers, including National Aeronautics and Space Administration (NASA) and the Pentagon. His supporters invoked the fact that he was diagnosed with Asperger's syndrome in his defense. Similar cases include Adrian Lamo, Viachelav Berkovich, and Ryan Cleary, all hackers who faced trial and resorted to Asperger's as a mitigating factor. It remains to be seen if something like an autism defense will materialize in future hacking court cases. Though claiming Asperger's is one thing and having it assigned by the authorities is another, it is nevertheless instructive that both instances rehearse the profile of the asocial male discovering a new social vocation through computer technology.

Conclusion: the nobility of non-reciprocity

While the "Aspie" might have a privileged perspective on today's network society, when it comes to the social world of interactive protocols and norms, he is quite at a loss. Autism presents a sobering lesson on some fundamental assumptions about communication in the digital age. Jim Sinclair (1993) is one of the first to voice the challenge most poignantly:

> Autistic people are "foreigners" in any society. You're going to have to give up your assumptions about shared meanings. You're going to have to learn to back up to levels more basic than you've probably thought about before … [to] give up the certainty that comes of being on your own familiar territory, of knowing you're in charge, and let your child teach you a little of her language, guide you a little way into his.

Autism challenges taken-for-granted assumptions among neurotypicals about intelligence, thinking, and interaction and provides, in short, a lesson in social epistemology. The autistic perspective serves to defamiliarize the normativity of NT systems of symbolic exchange: that so much of the neurotypical world depends on speech interaction may seem to the "social foreigner" as rather narrow minded.

That autism can amount to a radical critique of how we understand communication is the message of Amanda Baggs's 2007 YouTube clip "In My Language" (now over 1.25 million views). The 8-minute video begins with a woman flapping her hands, rocking back and forth, and performing repetitive behaviors such as stroking a necklace, turning a drawer knob, or smelling a book page, all the while producing a lengthy hum. Then, a black screen with the words "A Translation" appears with an eloquent narrative addressing the viewers. Baggs, a 27-year-old autistic at the time, who does not speak, created the clip by herself, using text-to-speech software that produces a synthesized voice. Still showing repetitive behaviors, Baggs proceeds to explain, "my language is not about designing words or even visual symbols for people to interpret. It is about being in a constant conversation with every aspect of my environment." This way of reacting to her surroundings, she claims, is neurotypically described as being isolated in a world of her own. "It is only when I type something in your language that you refer to me as having communication," she reproaches. To her, communication is much broader: It involves smelling, touching, tasting, listening, looking. Viewing autistic people as non-communicative is not only mistaken but unjust: "other people are not considered non-communicative if they are so oblivious to our own languages as to believe they don't exist."

As a non-speaking autistic woman, Baggs contrasts with the high-tech Asperger's type. Her use of new media claims a public voice in her own terms. By candidly exposing herself, Baggs holds a mirror up to the normal and the normative, rendering their language as only one dialect of human communication. This is one of the most fascinating things about autism: The way it calls for thinking beyond the deeply normative ideal that links sociability with speech interaction. Bettelheim's brutal treatment of non-communicative patients is one argument against this vision; the challenge leveled by Bagg's techno-rhetoric is another. Baggs's disability puts her on the cutting edge of new materialism, thing theories, and what Walter Benjamin (1973) called "empathy with inorganic things" (p. 55). She, like other people with ASD, may be the pioneers of object-oriented ontologies, a disability and an ability that only intensifies the uniquely human capacity to abstract and to work with things. The sobering moral here is that the plea to rethink communication in terms other than compatibility and reciprocity is heard most starkly in a time when digital technologies allow for instantaneous talking, texting, sharing, linking and tweeting freed of their embedment in the nonverbal. Imagining communication otherwise than the normative models of interaction is needed precisely when communication seems to be most self-evident.

The case of autism has shown how the limitations disability imposes on people who are consequently excluded from the norm might prove productive in encouraging various work-arounds and substitutions, which we may call media in an expanded sense. Yet, while celebrating atypical minds, it is imperative not to forget the pain and price paid by those estranged from the hegemony of normativity. Autism reveals the nobility of nonreciprocal relations. As Emmanuel Levinas (2001) taught, responsibility for another proceeds "without concern for reciprocity" (p. 111); it does not hang on the other responding in kind, or even responding at all. Nonreciprocal relation demands more than acknowledging difference: True respect for diversity demands acknowledging the other, the disabled other in this case, without pretending that the otherness does not make a difference—and, moreover, does not carry an obligation. The ethical challenge autism raises is of accepting disability as a human condition without effacing the radical difference caused by disability—the chasm in human relations in this case. Non-reciprocity is not the end of responsibility but rather its very beginning. That autism is a variety of being human is indeed a noble thought, but nobler still is attending to this variety without losing sight of the actual incapacities it entails. For every way of being human has its incapacities.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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