When Face-to-Face is Screen-to-Screen:
Reconsidering Mobile Media as Communication Augmentations and Alternatives

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INTRODUCTION

The fear that mobile technologies impair face-to-face human communication is a core anxiety of modernity.[1] Long before their capacity for internet connectivity, portable media such as newspapers, music players, and even kaleidoscopes were blamed for dulling an individual's sense of presence and attention to environmental cues[2]—or, as the idiom goes, "nose in a book, head in the clouds." At present, concerns abound that the overuse of smartphones limits the ability to make eye contact and develop empathy for others. Contemporary apprehensions about mobile communication, and its impact on intimacy and compassion, are not limited to lay experts either. MIT professor Sherry Turkle (whom the *New York Times* calls "a kind of conscience for the tech world")[3] implores her readers to repair their relationships by "reclaiming conversation" from the overpowering grasp of their graspable technologies.[4]

While there are certainly very real dangers to the pervasiveness of networked mobile communication devices (such as distracted driving while texting and intrusive location-based personal data collection), claims of mobile media's direct and negative effects on meaningful human connection have not gone unchallenged. Scholars of interpersonal communication and social interaction have repeatedly demonstrated through qualitative and quantitative research that

"digital dualism"[5]—a dichotomy between devalued technological "chatter" and valued human "conversation"— misrepresents the complex bonds that individuals negotiate through and with new media.[6]

What has been *less* subject to scrutiny, though, is the way in which "moral panics"[7] about mobile media and the demise of conversation privilege oral communication as fundamental to the human experience. For example, writing about the seductive qualities of "machines with voices" (such as Apple's Siri), Turkle explains that, "During our evolution, the only speech we heard was the speech of other humans. Now, with the development of sophisticated artificial speech, we are the first humans asked to distinguish human from non-human speech. Neurologically, we are not set up to do this job."[8] Turkle's biological argument about the inherent inferiority of technology-based voices is predicated less on a body of empirical research (which actually indicates the contrary)[9] and more on a personal belief that there is some universal form of talking and listening that all bodies easily and naturally do.

The implicit corollary—that oral communication is independent from technology and learned technique as to be "reclaimed" from it—is similarly open for debate. Anthropologist Joshua Reno argues that "the very idea of language 'acquisition' implies that speech is something owned, a property that we comfortably possess, rather than a skill that most, but not all, are equipped for, which requires practice and may involve lifelong struggle."[10] The "unnaturalness" of mediated communication is inherently subjective and dynamic. It is a quality dependent not only on the content and context of human conversation,[11] but also on the bodily and cognitive capabilities, at any given moment, of those in dialogue with one another.

I reject the idea that mobile communication and authentic human conversation are antithetical, and turn instead to the work of disability studies, which invites us to rethink normative assumptions about embodiment and cognition.[12] Critical intersections of disability studies, feminist theory, and science and technology studies provide frameworks for understanding how communication technologies constitute and articulate the conversing subject.[13] Disability can be an asset to communication theory and an organizing principle for communication studies, intersecting with how queer theory, feminist theory, and critical race theory have all strengthened existing formulations about how certain forms of personhood are valued and devalued within sociotechnical systems.[14]

In this chapter, I highlight the experiences of one group of mobile media users: disabled individuals who are unable to or who have significant difficulty talking, and who supplement their capacity for speech through tools and strategies known as augmentative and alternative communication (AAC).[15] Individuals with complex communication needs—due to developmental disabilities (e.g. autism), acquired disabilities (e.g. resulting from a stroke), or degenerative disabilities (e.g. ALS or Lou Gehrig's disease)—use AAC systems to augment or provide alternatives to oral speech as a primary (and socially privileged) form of human communication.

Though some individuals with significant speech impairments rely more centrally on an array of mobile media and an assemblage of human and non-human resources to "talk," I suggest subverting the normative structures used to classify human dependency on communication

technology in order to better account for the disabled experience as a human one. I argue that *all* mobile communication technologies in some way augment or serve as an alternative to conversation-as-embodied oral speech. I thus propose a theory of mobile communication that situates such usage along a spectrum of *communication augmentations and alternatives*. This spectrum is wide enough as to encompass the sending and receiving of texts with a mobile phone, as well as famed physicist and AAC user Stephen Hawking's delivery of a typed presentation through a tablet computer mounted to his power wheelchair. Both examples bypass the bodily production of oral speech.

I begin by providing an overview of how AAC functions as communication technology in order to highlight how conversation acts expressed through mobile media are inherently distributed across bodies, objects, environments, and practices. Next, I advance a theory of mobile media as communication augmentations and alternatives through a contextual analysis of the Oscar-nominated 2014 film, *The Theory of Everything*.[16] The movie chronicles the life of the aforementioned Hawking and is based on the memoir of his ex-wife, Jane Hawking.[17] Contextual analysis here allows for consideration of the film within society at large,[18] and specifically, societal moral panics around mobile media. *The Theory of Everything* is the highest profile mass media depiction of AAC to date, and offers multiple entry points for general audiences to understand the discursive construction of disability, ability, and mobile communication technologies. I conclude by suggesting new research approaches in the social study of technology that are opened up by the reframing of mobile media through a theory, not of *everything*, but of communication augmentations and alternatives.

DEFINING AUGMENTATIVE AND ALTERNATIVE COMMUNICATION

"Augmentation" and "alternative" are not fixed categories, and their distinctions are not always clear cut. Everyone, including those with significant speech impairments, uses a variety of communication forms over a given day. We all pull from a repertoire of methods and a range of tools to fit particular communicative opportunities, which leads to being more or less understood by others. From the clinical perspective of communication sciences and disorders, which focuses on diagnosis and treatment of speech impairments, there are two basic types of AAC systems—unaided and aided.[19] This distinction is similar to but different from those made in communication studies between unmediated, mediated, and computer-mediated communication. Unaided AAC systems rely exclusively on one's body to a convey message to another person, and are sometimes referred to as "no tech" AAC.[20] This includes non-spoken language such as smiling or frowning, non-lexical sounds such as laughs or groans, and sign language. Aided AAC systems differ from unaided ones because they require the use of tools or equipment beyond one's body in order to convey messages. This includes digital and non-digital physical objects, as well as other people who physically help to facilitate communication.

Aided AAC systems vary in their level of technological complexity.[21] "Low-tech" systems are cheap in cost, simple in design, and do not require a power source. Examples include pencil and paper, picture- and/or symbol-based communication cards and books, and alphabet boards. Battery-powered "mid-tech" devices can electronically store a few pre-recorded messages. "High-tech" computers permit users to type words or select symbols from a dynamic screen with changing options and convey messages through digitized and/or synthesized speech output.

High-tech AAC systems include apps combined with off-the-shelf smartphones and tablets that mimic more complex (and more expensive) speech-generating technologies. Aided AAC systems, as mobile technologies, are not necessarily digital or computerized, but anything that extends human function for communication.

There are two potential ways to select messages within an aided AAC system: direct and indirect selection.[22] With indirect selection, there are a number of intermediate steps to go through before the user can select and convey their intended message. One indirect selection technique is a process known as scanning. In scanning, a finite set of possible items (e.g. letters, words) are presented sequentially at an even pace, one at a time. This scanning process can be facilitated by a computer or by another person. Both means present items linearly or cyclically until one is chosen. The speed of the scan can also be increased or decreased. In computer-assisted scanning, when the scan stops on the intended message, the user activates an electronic switch to select it and convey the message to others through visual or auditory output from the machine. In partner-assisted scanning, a face-to-face communication partner identifies each item in the set of messages by naming or pointing to it, and waits a length of time for the user to signal via a sound or a movement the item they wish to communicate.

In direct selection, there are no such intermediate steps. The individual specifically indicates their desired message without going through additional channels. There are a number of direct selection access methods, or ways for a user to interact with the technology. The choice of access method depends largely on the possible limb movement and motor control of the user. An individual might use their body or a tool attached to their body to access the interface. For

example, one might point to a touchscreen using their hand (with fingers or knuckles) or foot (with toes). That touching or pointing might also be achieved through a capacitive stylus attached to long stick held by the mouth or attached to a hat or headband. Someone with quadriplegia might instead use their mouth to send signals to a communication device using air pressure by inhaling or exhaling though a straw known as a "sip and puff." Switches mounted on eyeglasses can also detect smaller movements of the cheek and head, which is how Hawking currently manipulates his high-tech AAC system.[23]

The above overview of AAC systems, message selection techniques, and access methods allows us to map a spectrum of communication augmentations and alternatives relative to embodied oral speech. All mobile communication technologies take time, effort, trial, error, and practice to master. What makes AAC systems distinct is not that they are used by people with temporary or permanent communication disabilities, but that they generally take more time, repeated effort, waves of trial and error, and consistent practice in order to use seamlessly in the speaking world. Effective communication through any mobile device is not only dependent on a user's own skills and abilities, but also on their conversation partners, who shape the context of communication through a given sociotechnical system.

DEVELOPING COMMUNICATION THEORY THROUGH *THE THEORY OF EVERYTHING*

The film *The Theory of Everything* illustrates how the authenticity of communication, the meaningfulness of conversation, and the intimacy of relationships cannot be reduced to the

presence or absence of mobile media. AAC systems in the film complicate neat distinctions between face-to-face, mediated, and computer-mediated communication. While the film presently a highly dramatized version of reality, and Stephen Hawking is certainly not demographically representative of all AAC users (to say nothing of the general populace), the portrayal of Hawking's use of different aided AAC systems in the years following his ALS diagnosis nonetheless provides useful material for theory building.

The film weaves less a professional tale about how Hawking developed his scientific ideas, and more a personal one about the unraveling of a marriage. The first appearance of AAC in the film occurs shortly after Hawking's emergency tracheotomy following complications from pneumonia. His wife, Jane, comes to visit him in his hospital's day room, though it is unclear to the viewer how long it has been since the surgery and what kind of communication Stephen and Jane have had since he lost the remainder of his oral speech. His emergency occurred while Jane was on a camping trip with their children and a family friend (and part-time caretaker of Stephen) whom Jane had developed romantic feelings for over the years.

Jane enters the room carrying a clear plastic eye gaze communication board about the size of a cafeteria tray with two small handles and a cutout in the middle (Figure 1). Six large circular stickers, each a different color, are affixed to the corners, top, and bottom of the board. Within each section designated by the circular stickers are letter stickers, 26 in all for the alphabet. There are also two areas for the words "YES" and "NO." The letters within each section are color coded in the same clockwise order that the large circular stickers appear on the board—green, yellow, blue, red, black, pink.

Figure 1: Jane and Stephen try to communicate with a spelling board, *The Theory of Everything* (2014).

Jane and Stephen make a first attempt at partner-assisted scanning. She sits down across from him, the board backlit by the light from the windows, and says,

> This is a Spelling Board. First, you tell me what letter you want by *blinking* when I say the color of the group that contains that letter. Once I know the group, you can choose the character *inside* that group by blinking again when I go through the colors of each *letter* in that group. *Apparently*. Okay? Let's just try.[24]

Instead of "reclaiming conversation" from technology, Jane tries to use mobile media to recover communication partly lost due to Stephen's disease, and partly due to her budding relationship with another man. This attempt is to no avail, however. The slightly melodramatic stage direction from the film's shooting script reads, "As Jane's eyes fill with tears … Stephen just keeps looking at her … then tries to speak. His mouth moves … but nothing—nothing ever again!—will ever come out!"[25] While these efforts at using the spelling board fail, a great deal is still communicated non-verbally between the estranged husband and wife, through Jane's welling eyes and Stephen's tearful gaze.

Over the course of the movie, aided AAC, mobile media, and partner-assisted scanning start to symbolize a wall between Stephen and Jane. The technologies and techniques become metaphors for diminishing intimacy between the two, and growing intimacy between Stephen and his nurse, Elaine Mason. Immediately following the hospital scene, Stephen has returned to his home, where Jane escorts Elaine upstairs to meet him for the first time. Immediately, Stephen and Elaine have an easy rapport in using the spelling board together (Figure 2). In fact, they quickly put the board aside, each having memorized the correspondence between letters and colors. With the physical technology removed, the technique remains; without the board between them, Elaine leans in closer and Stephen grins wider.

Figure 2: Stephen looks longingly at Elaine through the spelling board, *The Theory of Everything* (2014).

Jane grows uncomfortable with Elaine's increasingly central role in her husband's communication system and in his life. If she wants to talk with Stephen, Jane must go through a woman whom she considers a rival for his attention and affection. When Stephen upgrades to a state-of-the-art, computer-assisted scanning AAC system with synthetic speech output, Jane and Elaine's differing opinions on the American accent of the synthetic voice reflect this tension. Elaine is supportive of the accent, while Jane inquires with the engineer outfitting the machine if it can be changed. Stephen sits between them, physically and symbolically.

Ultimately, Stephen uses his mobile AAC system to tell Jane that he has decided that Elaine will be accompanying him on an upcoming trip to America instead of her (Figure 3). He uses his switch interface to type out the words on his personal computer, and then pauses a few seconds before converting them to synthetic speech output so that Jane can hear them from across the room. This declaration splits their relationship in half, and marks time into before and after the utterance. Jane tells Stephen tearfully, "I have loved you. I did my best." Not only have Jane and Stephen been unsuccessful communication partners through mobile technology, but it also facilitates their uncoupling as partners in marriage.
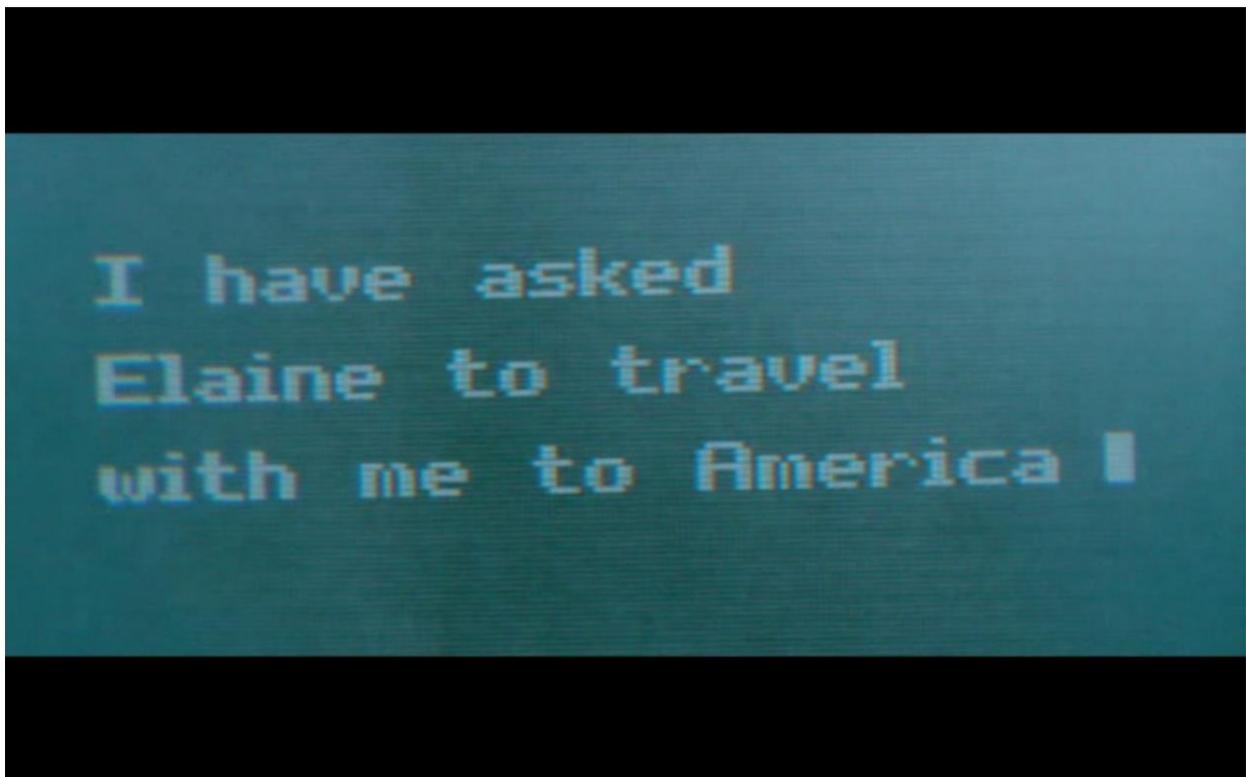

Figure 3: Stephen tells Jane that she will not be accompanying him overseas using his mobile AAC system, *The Theory of Everything* (2014).

Clear divisions between face-to-face and mediated communication easily blur upon a close reading of how Stephen and Jane fight, and concurrently, how Stephen and Elaine flirt. Stephen speaks through his AAC systems in ways that are simultaneously *face-to-face* (in terms of being co-present with another person), *board-to-face* (conversing with another through partner-assisted scanning), and *screen-to-face* (using his high-tech AAC device to converse with an individual who does not communicate with an AAC device). He does not speak with another AAC user in the movie, but if he had, that would add a dimension of *screen-to-screen* communication. Screen-based mobile media do not get in the way of Stephen and Jane's relationship, nor is his inability to produce embodied oral speech the cause of their divorce. Rather, the film rhetorically employs various forms of AAC—the spelling board, the synthetic voice, and the wheelchair-mounted computer—to tell a story about two people simply no longer being on the same page.

COMMUNICATION AUGMENTATIONS AND ALTERNATIVES

Tracing human connection and disconnection in *The Theory of Everything* reveals a great deal about the multimodal use of communication technologies. It demonstrates the value of re-centering mobile communication theory in response to, rather than in spite of, augmentative and alternative communication systems. Those with complex communication needs can only be considered "exceptional" or "outliers" in their use of mobile technologies relative to the ability to produce embodied oral speech. There are three tenets of a mobile media-as-communication augmentations and alternatives perspective that *The Theory of Everything* is particularly adept at illustrating. First, the film shows that distinguishing AAC from mobile media, and AAC users from mobile users, is a matter of degree rather than difference. Second, it highlights the

somewhat paradoxical role of oral speech within communication systems that purport to supplement or replace talking. Third, the movie draws attention to the limitations of digital dualism, particularly oft-repeated tropes about impaired eye contact and diminished empathy due to mobile media.

Degree and Difference

While Hawking relies on a complex arrangement of electronic and non-electronic forms of media to enable his social participation, the International Society for Augmentative and Alternative Communication (ISAAC) emphasizes the universality of augmentative and alternative communication for all people, not just those with impaired speech. ISAAC explains that "whenever something constrains the effectiveness of our spoken language we will use an augmentative form. Therefore the use of AAC is a question of *degree* rather than *difference* [emphasis added]."[26]

Any number of factors can constrain a person's ability to communicate solely through spoken language. ISAAC provides the example of a person trying to communicate with a friend getting a drink at the other end of a long, loud, and darkly lit bar.[27] One might wave their hand (as a form of unaided AAC) to get their friend's attention. Texting (as a form of aided AAC) would be a more efficient and accurate communication form for conveying one's drink order to the friend than whispering or yelling it across the bar. Whatever one's chosen methods of communication augmentations and alternatives, they vary based on current abilities, environmental factors, the individual or group with whom one is communicating, and the social norms of one's culture.

Individuals with and without communication disabilities also similarly supplant or supplement traditional "talk" by using popular forms of social media and mediated forms of "chat" (e.g. Google Chat, Snapchat). Autistic blogger Sara Luterman contends that "social media and smartphones are just a form of augmentative and alternative communication (AAC). Clicking the 'like' button on Facebook is no different than clicking the 'like' button on a speech generation device. The different [sic] is how many people can hear what you have to say."[28] Recent revisions to Medicare coverage for AAC devices in the U.S. reflect this growing awareness that social media are networked forms of AAC. Policy changes in July 2015 have led to medical insurance coverage of high-tech AAC systems that primarily function as speech-generating devices but can also serve as networked mobile communication technologies.[29] A theory of mobile media as communication augmentations and alternatives incorporates an emphasis on degree over difference not only in terms of media users, but also platforms.

Paradox of Oral Speech

Technological systems that augment or provide alternatives to oral speech do not function entirely outside of spoken language systems. Mobile users receive messages through their phones or ask Siri for directions, which shapes the face-to-face conversations they are having. While technologies provide Stephen with opportunities for connection and conversation, they also directly and indirectly augment Jane and Elaine's own communication. The two use the spelling board to talk with Stephen; used in tandem with their embodied oral speech, the board directly augments *their* communication too. Jane and Elaine are also indirectly implicated in

communication with the device (for example, what sentence Stephen chooses to type next), and thus socially construct reality through communicative acts with Stephen. AAC systems augment and serve as alternatives to embodied oral speech, but human and machine voices are still drawn upon as resources in various ways.

Digital Dualism

The role of eye contact in *The Theory of Everything* also complicates normative models and individualist assumptions concerning conversation, empathy and mobile communication. Instead of mobile media being a distraction from meaningful eye contact, alphabet boards (as a kind of mobile media) operate in concert with eye contact and gaze. Together, Elaine and Stephen create shared meanings and use partner-assisted communication as a kind of predictive text. For example, after Stephen selects the letter "B" from the spelling board, Elaine understands that he would like to drink Builder's tea (tea with milk and sugar). Rather than using machine learning (e.g. autocomplete in word processing software), this kind of message prediction entails human learning. Instead of typed input, an algorithm, and computer memory, partner-assisted scanning involves head and eye movement (e.g. looking, blinking); the partner building trust by remembering the user's tastes, preferences, and frequently-used language; and the cultural and social context of the communicative act. Eye contact is an integral rather than extrinsic part of Hawking's mobile communication.

It should also be noted that screen-based communication can be an important alternative and augmentation to face-to-face communication for individuals with various disabilities. The moral

privileging of looking someone in the eye compared to looking at a screen ignores the needs of those with sensory processing issues for whom direct eye contact can be overstimulating. Autistic adults and children also report valuing the opportunity to find those with shared experiences and common interests online without stigmatization or bullying.[30] The opportunity to expand modes of response through mobile media is something that those with and without disabilities often enjoy as an augmentation or alternative to face-to-face communication.

Conclusion

This chapter has tackled the relatively understudied convergence of disability, mobile media, and interpersonal communication. Through a contextual analysis of the acclaimed Stephen Hawking biopic *The Theory of Everything*, I have illustrated how AAC technologies are mobile communication tools, with their capacity for mobility and communication shifting dramatically within the past few decades. When we consider AAC systems as such, I argue that this allows us to re-orient our understanding of human expression through mobile devices as existing along a spectrum between communication augmentations and communication alternatives to embodied oral speech. Why then, we might ask, is it more socially stigmatizing for a disabled person to use a stick mounted on their head to press keys on a keyboard hands-free, and less stigmatizing for a non-disabled person to employ a selfie stick to take a photograph without directly touching the phone's button? Both exist along a spectrum of communication augmentations and alternatives.

New theoretical concepts such as communication augmentations and alternatives are needed in media and communication studies in order to describe the complex relationship between

technology, sociality, and embodiment in contemporary sociotechnical systems. Multimodal augmentative and alternative communication systems disrupt the notion that computer-mediated communication and face-to-face communication are entirely distinct. Communication scholars might take up the question of how augmentations and alternatives to embodied oral speech are imagined as affordances in computer-human interaction, particularly in light of current development in pervasive computing and "smart" innovations.[31] What social, material, and affective factors, for example, shape how a child perceives the authenticity of their conversations with Hello Barbie, Mattel's foray into artificially-intelligent talking dolls?[32] Communication augmentations and alternatives offer mobile communication technology scholars a framework for studying the gaps between the spoken and unspoken, the rational and emotional, the strategic and affective.

In *Reclaiming Conversation*, Turkle writes that "we are being silenced by our technologies—in a way, 'cured of talking'"[33]; in turn, she offers "a talking cure."[34] Such talk of cures though incorporate illness and communication impairment only as a metaphor and is reductive of the human experience. It is not that Turkle and others who extol the virtues of face-to-face communication are ableist, but they are reproducing a false hierarchy. As Luterman explains, "People who oppose the use of screens aren't trying to silence disabled people. The problem is that they aren't thinking about us at all."

Future empirical work on mobile technology, mediated communication, and interpersonal relationships must move conversation about disability from the abstract to the concrete, to truly be *in conversation* with disabled individuals themselves. It is important not only to study media

artifacts about disability and technology but also engage openly with those with communication disabilities themselves.[35] This includes how they come to understand the role of technology in their lives, the conditions under which this relationship varies, and how it changes over time. Reorienting mobile media research and turning towards critical disability studies requires more humane and expansive approaches to the study of mediated human conversation, and communication theories that better account for the lived experiences of individuals with complex communication needs.

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