Call If You Can, Text If You Can't: A Dismediation of U.S. Emergency Communication Infrastructure

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Text-to-911 services have been launching across the United States over the past five years. The educational materials that accompany these launches frame text-to-911 as a benefit for d/Deaf and disabled people; the same materials urge able-bodied people to make voice calls. This article uses dismediation and an infrastructural disposition to analyze text-to-911 materials as influential agents in the shaping of a technological infrastructure that, by its exceptional nature, may resist domestication. Ultimately, I perform an infrastructural inversion, arguing that these representations use deafness and disability as "assistive pretexts" that ideologically justify technological changes while simultaneously excusing infrastructural holdovers, limited functionalities, and institutional biases that perpetuate a historical marginalization of disabled people and constrain communicative possibilities for all users.

Keywords: 911, deaf, disability, domestication, emergency, infrastructure

On a spring day in 2014, someone listening to FM radio in Indiana may have been startled by the sound of a stern male narrator in the midst of an advertising break. The voice asked, "In an emergency, what is best?" Then, it contrasted a panicked voice asking for help with a monotonously read text message. This public service announcement (PSA) explained the coming launch of text-to-911 services throughout Indiana, concluding that although this feature would be "a great help to the deaf and speech impaired, and other select situations. . . . B4 U text, voice is best" (Indiana 911 Board, 2014).

The choice to introduce a new media option (texting) to the infrastructure of 911 by asserting the value of an older option (voice calls) is unusual. In comparison with technological progress narratives of continual improvement, this PSA particularly seems to be performing a renunciation of its own technological advance. Furthermore, the presence of deafness and disability in this context is unusual because most 911 educational materials have focused exclusively on users who can speak, hear, and manipulate landline or

cellular telephones.[2] The frictions of this PSA prompt the central questions of this article: Why and how is this infrastructural change being made sense of through disability, and for whom?

To answer these questions, I turn to an archive of educational materials released to introduce text-to-911: PSAs and related Web pages or brochures from the Federal Communications Commission (FCC), the National Emergency Number Association (NENA), the states of Indiana, New Jersey, and Vermont, and municipalities including Arlington, Virginia; Rock County, Wisconsin; the Austin region of Texas; Maricopa County, Arizona; and Long Beach, California. While not exhaustive, this is a geographically diverse collection of publicly available materials.[3] I analyze these didactic media texts through the critical lenses of infrastructure (Bowker, 1994; Parks, 2015; Star & Ruhleder, 1996) and disability studies of technology (Alper, 2017; Ellis & Kent, 2010; Goggin & Newell, 2003; Moser, 2006), with particular attention to the practice of "dismediation," a method of theorizing "media change and technical design from a disability studies perspective" (Mills & Sterne, 2017, p. 366).

The work of this article is both infrastructural and interpretive. Approached with what Lisa Parks (2015) calls an "infrastructural disposition," representational texts can be analyzed for what they say about the networks of resources, protocols, and circulations that extend beyond their "mediated frames." Analyzing the promotional communications surrounding text-to-911 services can reveal the underlying ideologies, exclusions, and limitations of this telecommunications system. Historically, disability has been one such site of limitation and exclusion, through both inaccessible technologies and invisibility in 911 discourses.

Furthermore, public-facing educational materials are a key venue through which to shape the uses and meanings of technologies (Hallenbeck, 2012; MacKenzie & Wajcman, 1985; Paradis, 1991). Their weight is amplified in contexts—like 911—that resist domestication, the process by which technologies are made part of everyday life and shaped by users' meanings and practices (Haddon, 2011; Morley, 1988). Because of the cultural understanding of emergency as exceptional (Rubenstein, 2015; Scarry, 2012), emergency media systems do not offer most users opportunities for frequent usage or experimentation that would shape new practices. In this context, official educational materials are attempting to shape the public's perception and usage of text-to-911.

Ultimately, I argue that in these materials, deafness and disability function as what Mara Mills refers to as an "assistive pretext" (2010)—a preoccupation—that discursively reframes a mainstream technology (texting) as an assistive technology, both justifying its introduction and limiting the scope of infrastructural change. Using Bowker's (1994) method of infrastructural inversion—looking to the infrastructural changes to understand how a larger claim came to be seen as reasonable—I reposition text-to-911's promise to expand access for disabled people as a diversion from the persistent, even constitutive, gaps and limitations in 911 infrastructures.

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[2] The videos, coloring books, public relations materials, and other educational materials on the *Know 911* site only mention disability in connection to text-to-911 (National Association of State 911 Administrators, n.d.).

[3] Interviews with 911 dispatchers and staff around the country, conducted by the author since 2015, are used as background concerning dispatcher workflows and preferences.

This article begins by contextualizing 911 in terms of theories of infrastructure, domestication, and mediation (and dismediation). Literature from science and technology studies, communication, and cultural studies is brought into conversation to frame the current analysis, and historical research on deafness, disability, telephony, and emergency is summarized to contextualize the current archive. I then move into an infrastructurally informed discursive analysis of text-to-911 materials, organized thematically, demonstrating the intended audiences, uses, and meanings of this new media format. I conclude with a close reading of the NENA-endorsed tagline, "Call if you can, text if you can't," leading into the infrastructural inversion by which text-to-911 is promoted through an assistive prextext; disability and deafness are used both to justify the rollout of text-to-911 services and to excuse its shortcomings for an able-bodied audience.

Domestication, Dismediation, and 911 as Infrastructure

To begin, 911 is best identified as a mediating infrastructure, in which many human, institutional, and technological components are articulated to mediate a specific communicative act: the request for emergency services. Next, I consider some key descriptors—infrastructure, communication, emergency, and mediation—in turn; each informs 911's resistance to domestication and reliance on an ideology of ability that takes for granted normative bodies and capacities and excludes disabled users (Siebers, 2008).

As infrastructure, 911 is a layering of material networks and technologies, federal and state laws, business interests, public safety organizations, and caller expectations. It is primarily funded by state-level taxes and variously implemented by counties or cities via sheriffs, police departments, or dedicated public service answering points (PSAPs). At its core, of course, 911 is based on the standards of telephone operations in the United States. Elements of older telephonic infrastructures persist, as in the continued use of operators to route calls to appropriate localities and service providers (Reeves, 2017, p. 65). Like all infrastructures, telephone networks are "built on an installed base" (Star, 1999, p. 382), inheriting attendant strengths, limitations, and the inertia of existing structures.

In the case of 911, this means that "efforts to splice newer, digital technologies onto this aging infrastructure have created points of failure where a call can be dropped or misdirected, sometimes with tragic consequences" (Moore, 2011, p. 179). Over the past 25 years, computer-aided dispatch systems, reverse lookup of addresses by telephone number, voice-over IP services, cellular phones, geospatial data, and now text messaging have been added to this infrastructure, each challenging prior arrangements of technology and labor even as they fail to meet the expectations set by consumer technologies (Moore, 2011; Phillips, 2005). Uneven funding and implementation of services has also led to ongoing differences among jurisdictions, which is starkly visible in the piecemeal rollout of text-to-911 and related "Next Generation 911" digital upgrades.[4]

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[4] Next Generation 911 (NG911) is an ongoing project in the Canada and the United States, where the 911 Improvement Act of 2008 tasks the FCC with supporting upgrades. NG911 entails installing IP-based digital technologies to improve access, response, and interoperability of technologies such as phone, radio, and text messaging ("Standards for Next Generation 911," n.d.).

Current status maps resemble patchwork quilts, with robust services abutting those with outdated, limited, or nonexistent capabilities.[5]

The average user of 911 has little awareness of these changes, or of the operational or bureaucratic supports for this emergency service. In this way, 911 infrastructure exhibits what Star and Ruhleder (1996) describe as "embeddedness," a sinking into other social arrangements and systems that facilitates invisibility for those not closely involved in the system's use or maintenance. Nonetheless, the number itself is omnipresent—on police cars, as a feature of news and entertainment media, in public signage—rendering it "just there, ready-to-hand, completely transparent" (Star & Ruhleder, 1996, p. 112) when users require it. That 911 is ready to hand—habitually visible, and available for use without conscious deliberation—makes it an excellent example of what philosopher Elaine Scarry (2012) identifies as the necessary concretization of prior deliberation that enables action in an emergency.[6] Emergency systems, like 911, function best in that they require users to learn or remember the least, relying on integration with the routines of everyday life.

The processes by which a technology becomes part of everyday life have been analyzed through theories of the social shaping of technology (MacKenzie & Wajcman, 1985) and domestication (Haddon, 2011; Hirsch & Silverstone, 2003; Morley, 1988). Social shaping of technology situates the development and deployment of technology as within, and influenced by, social factors ranging from the economic to the state or ideological. Theories of domestication, similarly, posit that how people use technologies and incorporate them in daily life ultimately shapes the agreed-on meanings, design, and utility of a technology. Through domestication, the private sphere acts as a space "where the public meanings inscribed by and through commodities, beliefs and media and information consumption are . . . open to negotiation" (Hirsch & Silverstone, 2003, p. 17). Domestication has been used to study many different media technologies and contexts, but there has been little attention to contexts in which a technology may *resist* domestication by failing to offer opportunities for repetitive, iterative, or transgressive uses.

While telephones, both landlines and cellular, have certainly been domesticated in home and individual contexts, 911 resists domestication. This is in part because most individuals are relatively inexperienced with actual use of the system as a form of communication. Many callers are making their first call, and nearly all are doing so in exceptional circumstances. Users' inexperience is evident in miscommunications—calls in which their behavior does not accord with the structured communicative expectations of call-takers. The structure of 911 calls, explicated by organizational communications scholarship, requires individuals to describe and justify their need for services (Heritage & Clayman, 2010; Tracy, 1997).

This process fundamentally accords with what Jennifer Rubenstein (2015) describes as an "emergency claim." Rubenstein posits that in order to have a situation accepted as an emergency, one must offer an acceptable emergency narrative that describes an unexpected deterioration from a previously "normal" state of affairs and demands immediate action to restore that normalcy. This description of emergency accords with

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[5] As will be discussed later, 1,478 public safety answering points in the United States can currently receive text messages, of a total of over 8,600 PSAPs nationwide.

[6] There are, of course, good reasons to pause before automatically contacting 911; risks of racialized violence, in particular, deserve to be weighed before this habitual communication process is initiated.

dominant cultural understandings of emergency and is enforced through 911 educational materials and the series of questions that guide callers in making such a claim ("What is your emergency?").

Cultural narratives about the exceptional nature of *emergency* (Rubenstein, 2015; Scarry, 2012) work against mechanisms of practice, repetition, and innovation that normally characterize user behavior and enable domestication to occur and transform existing technologies or infrastructures. Additionally, the infrastructure of 911 is resistant to domestication in that harsh penalties are associated with using the service in a nonstandard way. Examples include the punishment of prank callers (Reeves, 2017), but also the more serious denials or delays in service to those who cannot engage with this expected communicative structure, such as non-native-English speakers (Raymond, 2014) or disabled callers.

The difficulties of domesticating 911 are amplified by the difficulty of exerting ownership or regular usage practices over what is, at its heart, a technology of mediation*.* Domestication theory emphasizes the "double articulation" (Hirsch & Silverstone, 2003, p. 15) of communication technologies as both object and media, engaged in linking individuals and households to a larger public sphere. This emphasis enables attention to mediation, a term that Sonia Livingstone (2009) argues "usefully highlights the artifacts and practices used to communicate" and "invites analysis of the social and organizational arrangements through which mediation is instituted" (p. 12). Studying domestication is not incompatible with studying mediation; however, the arrangements of power in a given media context may result in users being more or less empowered to shape the mediating structures through which they extend themselves into the world (Kember & Zylinska, 2014).

Mediation's emphasis on process and power was precisely the motivation for its use in the neologism of "dismediation," which Mara Mills and Jonathan Sterne (2017) propose as a method for theorizing "media change and technical design from a disability studies perspective" (p. 366). They propose that "dismediation centers disability and refuses universal models of media and communication" (p. 366). Rather than offering disability as a topic for media studies, Mills and Sterne propose a reconsideration of the foundations of media studies through use of disability as analytic and method. In what ways, we might ask, has the media infrastructure of 911 been shaped by society's understanding and treatment of disability?

Employing dismediation, we should be reminded that the infrastructural nature of 911 is not universal. For some users, complex infrastructures do not sink into the background, because their daily lives do not match the expectations about bodies, technologies, and social relations that characterize the system. Star and Ruhleder (1996) themselves use a disability example to highlight one such failure of infrastructure; "without a Braille terminal, the Internet does not work to support a blind person's communication" (p. 113). Similarly, historically, users' inability to use landline telephones because of hearing, speech, or motor impairments has prevented them from effectively using 911, requiring them to invent new solutions to any emergency. Harry Lang (2000), in his history of telephony for the d/Deaf, gives an evocative example:

> When a deaf man in New Jersey had a heart attack early one morning in the late 1960s, his [deaf] wife frantically sought help. She rushed out of their home screaming, but her frightened neighbors kept their doors shut. By the time she spotted a squad car on patrol and asked the officer to make the emergency telephone call, it was too late—her husband had died. (p. 5)

The "installed base" of 911—telephony—was a technology both grounded in and yet exclusive of d/Deaf users.[7] Mara Mills' (2010) work demonstrates that deafness was integral to the technological conversions of speech into signals (and vice versa); deaf individuals were even hired to work in Bell's organization, because it was hoped that this technology would both standardize telephonic communication and enable deaf people to more easily learn speech through visual feedback. However, Mills' recounting of this early history closes by describing the role of deafness as one of an assistive pretext, in which technologies designed for disability access were ultimately redirected toward mainstream users and profits, abandoning disabled audiences.

Thus, the domestication of telephony occurred without participation by deaf and other disabled users, requiring a process of retrofitting the technology for accessibility. Led by deaf individuals, the development of accessible telephony was hampered by corporate interests that resisted user-led technological innovation; AT&T claimed ownership of telephone handsets, drastically impeding attempts to create accessible telephone infrastructures by modifying in-home handsets to work with modem technology (Lang, 2000; Strauss, 2006). It was not until 1982 that the Telecommunications for the Disabled Act asserted that a lack of telephone access for people with disabilities "would disserve the statutory goal of universal service [and] deprive many individuals of the opportunity to have gainful employment" (p. 4),[8] prompting deployment of these technologies. Nearly a decade later, the Americans with Disabilities Act (1990) required 911 centers to offer direct (TTY) access to their services.[9] While the development and deployment of accessible technologies is important for access, the separation of assistive media technologies from mainstream modes offers accessibility while preserving normative technological systems unchanged. This further inhibits the ability of d/Deaf and disabled users to exert a shaping influence on the meanings and uses of a mediating technology such as the telephone, or the uses to which it is put. Rather than allowing deafness to alter the telephone, via the social shaping or domestication enacted by marginalized users, this history illustrates that the telephone was retrofitted and made exceptional for deaf people.

Thinking about 911 through theories of domestication and dismediation suggests that the current moment could be one of meaningful change. The launch of text-to-911 services could provide an opportunity to shift the infrastructural dimensions of 911 through new user practices and through the inclusion of d/Deaf and disabled users in a mainstream format. However, the exceptional nature of 911 as an emergency communications technology is likely to continue to work against its domestication. The mediation of 911 is not egalitarian; in the absence of practice using and thus domesticating this technology, infrastructural interests and texts dominate its available meanings and uses.

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[7] I use "d/Deaf" in my own writing as a means of indicating both people who identify as culturally and linguistically Deaf and those who do not (who may be late-deafened, raised in oralist traditions, or who do not use American Sign Language). This is a common framing within contemporary Deaf and disability studies. I have retained the use of "deaf" in historical contexts and quotations, and have used "deafness" to indicate the physical condition.

[8] H. Rep. No. 888, 97th Cong., 2d Sess. 4 (1982). For further discussion of the legal contexts and specific technological systems that have enabled telephony for disabled and d/Deaf Americans, see Peltz Strauss (2006).

[9] Direct access, rather than relay service, is important because relay calls can take between 3 and 8 minutes to connect—far longer than the recommended 10-second answering time for 911 voice calls (Dejean, 2017).

In the following section, I turn to the present, analyzing text-to-911 materials for their ideological assumptions and infrastructural implications. The archive of educational materials assembled in this article acts as a window into officially desired uses and meanings of 911, emergency, and text messaging and their implications for this media infrastructure. Alongside dismediation, I adopt what Lisa Parks (2015) calls an "infrastructural disposition," thinking "not only about what they represent and how they relate to a history of style, genre, or meaning but also think[ing] more elementally about what they are made of and how they arrived" (p. 357.) In my analyses of these materials, I focus on discursive themes that emerged across the corpus of PSAs and similar materials. Thus, my readings of these materials are not focused on the pragmatic goals or organizational limitations that no doubt influenced their production. Regardless of intent, these materials communicate about the meanings of both disability and 911 infrastructure, often simultaneously.

Text-to-911 Promotional Materials

This article began by recounting a public service announcement released by the state of Indiana, which emphasized a contrast between spoken and textual communication. It presented voice communication as an indicator of both affective distress and authenticity; a raised, panicked voice was contrasted with robotic readings of a text message. The spot concluded by suggesting that in an emergency, "voice is best" (Indiana 911 Board, 2014). This differential valuation of communication, when tied to the exemptions for "the deaf, speech-impaired, and in certain other situations," positions not only voice communication as "best," but also suggests that those who can speak are best. Those who fit into the existing communicative infrastructure of 911, based on able-bodied norms, are discursively positioned as "better" than those who do not, who remain exceptional users of this public system. These valuations of communicative modes and 911 users implicitly filter down to the technologies themselves; by positioning text-to-911 as something other than "best," this rhetoric allows it to be understood as allowably worse because it serves only a marginalized, even deficient, audience.

Read infrastructurally, as a sign of a system that underlies its conditions of being, the Indiana public service announcement points to ideological anxieties about technological capabilities, labor practices, and user behavior. Deafness and speech impairments function as assistive pretexts that assuage that anxiety by staving off large-scale change to the 911 system through presenting text-to-911 as an assistive technology for people with disabilities, not a mainstream option. The anxieties expressed in this public service announcement were echoed in news about the rollout. Questions about emoji use, how to interpret photographs, abbreviations, and possible increases in pranking or frivolous requests dominated initial conversations in professional emergency and law enforcement contexts (Anderson, 2014; Frommelt, 2014). Not only does voice express affect, then, but it is also taken by many within 911 operations to be an indicator of sincerity, particularly in contrast to text messages.

These anxieties are calmed through attempts to shape the meanings and uses of text-to-911. While this shaping can be technological—in Indiana and elsewhere, the software used to respond to 911 texts does not accept images or emoji—it has also come into effect discursively. Public service announcements and other educational materials attempt this communicative control through three strategies: education about the proper usage scenarios, aimed at able-bodied people; instructions for using text-to-911, including what information to send and what messages to expect from dispatch; and messages that are about disabilities, or even aimed directly at d/Deaf and other disabled audiences.

Proper Usage Scenarios

Many of the promotional materials released in support of text-to-911 rollouts focused on specific use cases in which text-to-911 was appropriate for able-bodied people. For instance, in Vermont, which began service in 2014, a dedicated radio ad described using the service in a domestic violence scenario. A woman's voice describes an abusive relationship, while in the background, a man is heard shouting about a messy house. She goes on to explain, "One day, when he was out of the room, I decided to get help. But I was worried that if I called 911, he would hear me talking to the emergency operator. So, I sent a text message instead" (Vermont 911 Board, 2014a). She concludes, "Even when you can't speak, there's still a way to get help. Text-to-911 saved my life, and it can save yours, too" (Vermont 911 Board, 2014a). This example goes to great lengths to explain why a voice call was impractical, justifying use of a text message. Similar representations of abusive relationships (all with white female victims in heterosexual relationships) were seen in materials from New Jersey and Wisconsin.

The other scenario seen frequently in these PSAs was nearby property crime. Home invasions and car theft were presented as circumstances in which a voice call might be dangerous. These spots uniformly featured signs of White middle-class life: a Vermont radio spot about home invasions began with the sounds of children playing, as a woman stated that "we" (implying a partner and family) "usually feel pretty safe here" (Vermont 911 Board, 2014c); a New Jersey video showed a young White woman crouching behind a Toyota Prius to avoid an ambiguous hooded figure in a parking garage (New Jersey Government, 2016); and spots from Rock County, Wisconsin, and the Austin, Texas, area featured well-appointed homes in which White women or children hid in closets to text 911 about intruders.

The centering of well-off, able-bodied White users was perhaps strongest in a PSA from Virginia (Arlington TV, 2016). It opens with a middle-aged White man exchanging texts with his son as he enters a parking garage. The texts appear, in varied shades of blue, as overlays. He drops his keys, and as he crouches behind a shining SUV to retrieve them, a carjacker starts to break into a nearby car. The first man then initiates a text to 911 (Figure 1). As in the Vermont domestic violence PSA, this spot concludes with an arrest—a middle-aged White man in a police uniform is seen apprehending the carjacker, revealed to be a younger White man. The protagonist then receives a text from his son, asking what's taking so long. He smiles and replies that he's on his way.

The choice of "appropriate" scenarios for texting is thus predicated on amiable relationships with the policing apparatus and a generally privileged stance. There is no sense that police interactions could themselves be a source of further danger. This is obviously the case for people of color, particularly Black men, who are routinely subject to higher levels of police surveillance and violence (Browne, 2015; Cazenave, 2018; Ritchie & Davis, 2017). It is also true for disabled people. Many disabled people do not (or cannot) engage with emergency services in expected ways, leading to violence when disabled people are misread as willfully noncompliant or threatening (Herrington & Clifford, 2012; Kesic, Thomas, & Ogloff, 2013). Deaf people are also subject to these potentially violent police encounters, as "when officers often don't realize we can't hear them, it can lead to confusion or worse . . . from wrongful arrests, to brutal beatings, to even homicides" (American Civil Liberties Union, 2014). That considerations about communication barriers, bias,

and police escalation are left out of this first category of public messaging reinforces its audience as generally privileged (White, middle-class) citizens who expect the police to be a solution to—not source of—danger.
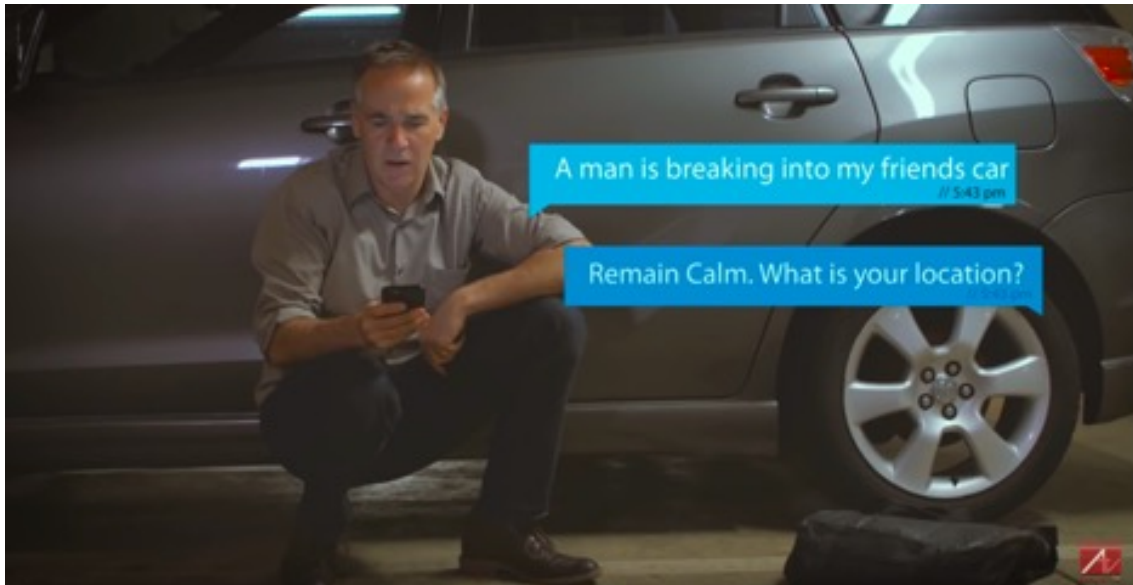

Figure 1. A still from the Arlington, Virginia, Text-to-911 PSA, showing a middle-aged White man crouching next to a car, text bubbles beside him.

Additionally, these materials omit a common type of 911 call—accidents or injuries. Accidents requiring medical attention, though common, are not presented as justifiable cases for texting. This implies that the users being addressed by these PSAs are imagined as consistently able-bodied, always capable of a voice call. The Whiteness, able-bodiedness, and relative economic ease depicted in most of these PSAs suggests that this audience—a typical target for new technologies—was instead being disciplined out of using text-to-911. Rather than presenting texting as broadly useful or even desirable, these materials urge restraint by presenting only select cases in which texting would be appropriate for the able-bodied people who are both seen in, and the audience for, these messages.

Instructions for Using Text-to-911

Many of the same PSAs emphasized instruction, teaching audiences not only when but also how to properly text 911. This emphasis on communicative control recalls the highly ritualized nature of emergency calls, a form of "institutional talk" that adheres to a fairly narrow structure of requesting service, dispatcher questioning, and response to the initial request for emergency services (Heritage & Clayman, 2010). Of course, most callers are novices with this structure and bring different expectations to the call than do professional dispatchers (Tracy, 1997). This problem becomes particularly pronounced in the context of contemporary communications, in which "consumer expectations for accurate and timely response to 911

calls are based on the advanced features available on most communications devices" (Moore, 2011, p. 180). Thus, educational materials provide potential callers with explicit instructions.

To return to the Rock County PSA, while the audio described usage scenarios in general terms, the visuals illustrated specific cases. In addition to showing individuals in these situations, there were regular zooms to the screens of smartphones, on which text messages appeared as they were typed. Uniformly, these texts demonstrated the "proper" format of a text to 911: requests for service, specific location information, and a brief description of the problem. For instance, the woman experiencing a home invasion was shown typing "Send the police to 1220 Cherry St. in Janesville. Someone just broke into my house" (Rock County Communications Center, 2015). This format accords with instructions from numerous jurisdictions, as in the Vermont domestic violence spot, which explained, "I put 911 in the send-to field. In my first message, I gave my address and the reason why I needed help" (Vermont 911 Board, 2014a).

Along with instructions about what to do, many jurisdictions are clear about what not to do. Richmond, Virginia's, website commands visitors, "Do not text and drive. Do not send photos or videos to 911 at this time. Do not copy others on the message to 911" ("911: CALL" n.d.). Long Beach urges texters to "text in simple words—send your message without abbreviations, slang, or emojis" (City of Long Beach, 2017). While photos, emoji, and group texts can be (and often are) technologically excluded, educational materials emphasize their exclusion as a matter of communicative style.

The preferred communicative style mirrors that of voice call protocols, with an interrogative structure in which dispatchers evaluate and respond to requests for services through asking callers a series of questions (Heritage & Clayman, 2010; Raymond, 2014; Tracy, 1997). This is, again, a style quite reminiscent of voice call protocols. Rather than adjusting those protocols to accommodate new technologies and styles of communication, educational materials attempt to discipline unruly texters into preferred modes of interaction in order to reduce the possibility of misunderstandings.

Early concerns about the use of emoji, abbreviations, and pranking were all based on an assumption that these formats would lead to increased misunderstandings: Captain Dave Bursten of the Indiana State Police, for instance, warned that "Autocorrect can change 'my house is on fire' to 'my horse is on fire'" (Weidenberger, 2014, para. 14). However, misunderstandings and variable interpretations have always characterized the conversational production of emergency response. Research in organizational communication has demonstrated that even in voice calls, gaps in expectations, callers' affective states, varied degrees of linguistic competence, and call-takers' skepticism can lead to failures of the 911 apparatus (Garcia & Parmer, 1999; Heritage & Clayman, 2010; Raymond, 2014; Tracy, 1997). All communication involves interpretation, and the possibility of misinterpretation. Furthermore, even with educational efforts, 911 communication remains subject to gaps and miscommunications as an unknowing public—disabled or not—faces specific expectations.

Disability Content

Many text-to-911 PSAs reference (or directly address, via American Sign Language) d/Deaf or disabled users. Vermont released two PSAs featuring a White woman who identifies herself as deaf and

delivers her message via ASL, with captions and a voiceover added. In one, she texts from the side of the road because her car has broken down, and she needs a tow truck (Northbranch Media, 2013). In another, she recounts texting 911 after seeing her neighbor fall off his ladder (Vermont 911 Board, 2014b). These contexts are notably different from the scenarios highlighted earlier: She is not shown using text-to-911 in response to a threat of physical danger. Thus, while the domestic violence spot concluded, "Text to 911 saved my life, and it could save yours, too" (Vermont 911 Board, 2014a), the neighbor spot concluded, "My neighbor is doing ok, and that's because I was able to text 9-1-1 and get help right away. . . . that can be a real life saver" (Vermont 911 Board, 2014b).

Strikingly, someone else's fall from a ladder is also the example used by Rock County, Wisconsin. As a female narrator explains, "If you are deaf or hard of hearing, texting would likely be your best option," a White man's hands type a text message; on the screen of his phone, the message appears as "send ambulance to 155 Smith rd [sic] in Beloit. My neighbor fell from ladder" (Rock County Communications Center, 2015). In both cases, d/Deaf people are positioned as helpers, and not themselves in need of aid. This suggests a different messaging strategy than those used for able-bodied audiences. In the case of d/Deaf or communicatively disabled users, all uses of 911 are appropriate for texting. By highlighting bystanders seeking assistance, these spots take for granted that it would be appropriate for d/Deaf and communicatively disabled users to text in more serious, dangerous, or life-threatening situations.[10] Such messaging also, however, suggests that the value of text-to-911 lies in enabling d/Deaf or otherwise disabled people to inhabit a form of proper, responsible citizenship through which they can be of service to nondisabled people in their communities.

In all the PSAs described earlier, texters are instructed to take the additional step of disclosing deafness so that dispatchers can send interpreters to the scene. In the Vermont neighbor PSA (Figure 2), the woman explains, "I also wrote that I am deaf, so the responders would know how to communicate with me" (Vermont 911 Board, 2014b).

Beyond this utility, disclosure serves the purpose of allowing dispatchers to judge the appropriateness of a text message for a given individual. For instance, the previously discussed instructional materials indicate that it would be inappropriate for a hearing person to send a text message when a neighbor is injured. Thus, in the absence of disability disclosure, the dispatcher would request to switch to a voice call. Beyond the legacy protocols that guide 911 centers, and the implicit valuation of voice as a form of affective and authentic communication discussed earlier, this decision is often driven by 911 dispatchers' desire to hear not only the informational content, but also background noise that might provide further information.[11] In comparison, text messaging may be informationally thinner and less desirable from the perspective of workers.

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[10] A PSA from Arizona is an interesting anomaly in which a deaf couple use ASL and text-to-911 to communicate with one another and the dispatch center about a potential home invasion (City of Chandler Police Department, 2018).

[11] This assertion is primarily based on interviews with 911 dispatchers, who often describe holding a conversation while picking up indicators of traffic, surrounding people, or other factors that might alter their response.
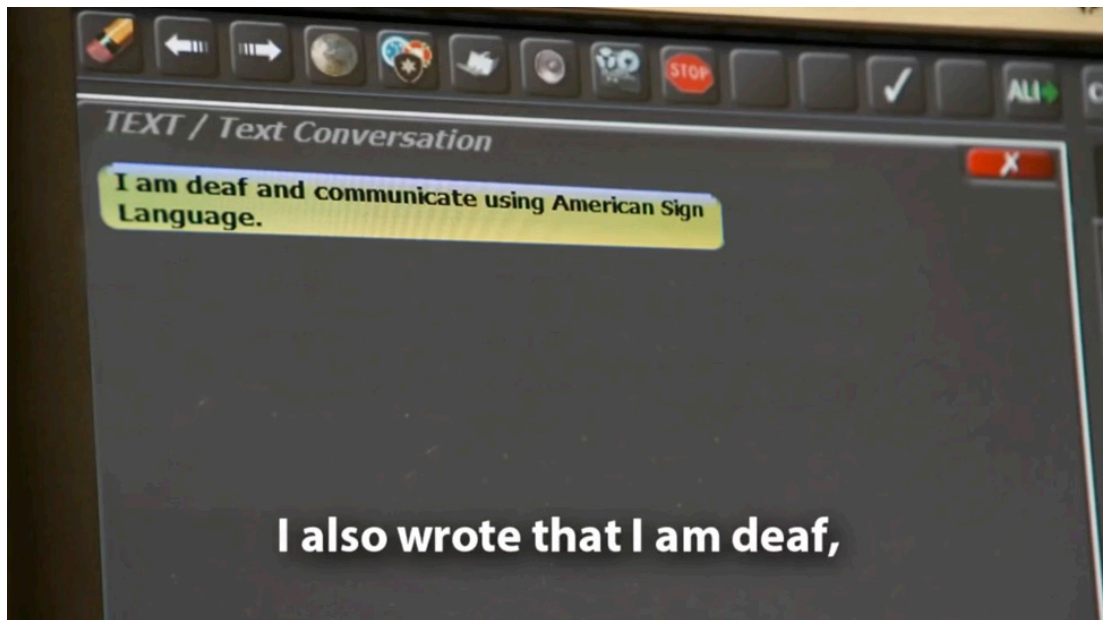
Figure 2. A still from the Vermont "neighbor" PSA, showing a dispatcher's computer screen, where texts are received, and a text declaring the sender to be deaf.

Nonetheless, for d/Deaf and communicatively disabled people who text 911, this obligation to disclose is not indicative of an inclusive system, but of an assistive one that offers a specialized service. Access to this service requires a disclosure disability to justify use of text-to-911 in situations other than those considered appropriate in educational materials. While some measure of justification is always required in a 911 call, given that it is not an on-demand service, but is characterized by dispatchers acting as gatekeepers to services (Heritage & Clayman, 2010), disclosure differs from justification in several ways. First, whereas providing a justification for emergency service hinges on description of current events, disability disclosure may require personal details about one's body or past, potentially invoking traumatic pasts and lingering psychological effects (Kafer, 2016). Given the possible difficulties of disclosure, requirements for "bureaucratic disclosure" to verify disability and ensure that people are deserving of services may be burdensome (Carroll-Miranda, 2017). For instance, when reporting a neighbor's fall to 911, a caller's health would normally be irrelevant; personal disclosure of health or disability would only be required of disabled callers to justify their use of texting. This additional burden of disclosure could function as a barrier to access for people who may not wish to disclose their own disability or health information when not necessary.

By requiring disclosure beyond justification, text-to-911 is positioned as assistive technology, limited in its audience and utility to those who have proved their need (disability). This, then, is the assistive pretext of text-to-911—use of a mainstream technology is disciplined, constrained, and directed in such a way as to make it of limited use and justify its infrastructural limitations.

Call If You Can, Text If You Can't

Across these subgenres of public service announcements, there is some uniformity: Many conclude with the tagline, "Call if you can, text if you can't." This phrase has proliferated across time and geography; it is used in materials from the FCC, California, Missouri, New Jersey, Texas, Virginia, and Wisconsin. Often displayed in a red logo format (Figure 3), produced and distributed by NENA, this phrase is ripe for a disability-inflected reading.

Figure 3. NENA logo, displayed on a PSA created by the Texas School for the Deaf (Commission on State Emergency Communications, 2018).

The structure of this tagline emphasizes capacity—what one can or cannot do—in such a way as to set up text-to-911 as (again) a lesser alternative. Essentially, the structuring of this phrase around capacity communicates that texting is only for exceptional circumstances and that deafness and disability are exceptional embodiments and communicative situations. This framing reasserts the centrality of able-bodied audiences while using disability as an assistive pretext that both justifies and minimizes the need for robust text-to-911 infrastructures. In other words, disability is used to demonstrate that there is a need for new technologies to become part of the 911 infrastructure, but framing these technologies as assistive ("for" disability) simultaneously minimizes the necessity of larger changes to the infrastructure, logistics, and cultural expectations of this communications system.[12]

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[12] It should be noted that in PSAPs with texting technology, accepting requests via text is generally no more burdensome than taking a phone call; able-bodied users who text are not monopolizing finite resources.

Returning to the assistive pretext, Mills (2010) writes that disability may serve as either "precursor" or "pretense" to other technological development. In the case of 911 infrastructure, it is a preoccupation; I mean preoccupation here in the sense of a distraction, an ever-present and engrossing rationale or example. In early telephony, deafness was used as "metaphor or advertisement" (Mills, 2010, p. 39), and deafness and disability serve similar promotional purposes in current text-to-911 materials. News and educational materials alike present text-to-911 primarily as a benefit for disabled people, often as a feel-good story: "Text-to-911 likely saves life of deaf woman in San Bernardino" (Insheiwat, 2015, headline). In a context in which the exceptional nature of 911 as a media infrastructure works against familiarity and domestication, such messaging establishes the technology as an obvious improvement for the disadvantaged and an inspirational story for mainstream audiences.[13] This, in turn, may discourage the public from expecting or advocating for significant changes in a largely invisible safety infrastructure.

To glimpse these limitations, it is fruitful to interrogate the use of "you" in this tagline. While common in marketing and tech contexts, this direct address nonetheless locates the source of capacity within the individual. The inability to call is localized to particular bodies and contexts, recalling individual and medical models that position disability as an individual deficit (Shakespeare, 2006). The ability, or inability, in this tagline is similarly constructed as innate and localized to a body or situation. Such an understanding conducts an ideological erasure of the societal factors that may have bearing on access or ability (Kafer, 2013). Just as disability is a matter of relationships between bodies and their societies, and infrastructure a matter of conditional relationships, the ability to text 911 is affected primarily by the relationship between potential users and their geographic or municipal context. Whether or not "you" can call, or text, is entirely dependent on what infrastructure has been made available wherever you may be.

This, then, is the infrastructural inversion enabled by close attention to text-to-911 materials. Geoffrey Bowker (1994) describes his method of infrastructural inversion as follows:

> Take a claim that has been made by advocates of a particular piece of science/technology,
> then look at the infrastructural changes that preceded or accompanied the effects claimed
> and see if they are sufficient to explain those effects—then ask how the initial claim came
> a posteriori to be seen as reasonable. (p. 235)

In this case, the central claim is that text-to-911 technology will expand access for deaf and disabled people, but the infrastructural changes are such that access for all people is uneven and partial.

The rollout of text-to-911 is ongoing, affected by variable state budgets and degrees of political will. As of June 2019, the FCC has 1,478 public safety answering points registered as capable of accepting text messages; there are 8,618 PSAPs in the United States ("911 Master PSAP Registry," 2018, "Text 911 Master PSAP Registry," 2019). Barriers to upgrades are primarily financial, as many states have poorly funded 911 operations due to tax structures or budgeting decisions ("Standards for Next Generation 911,"

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[13] Disabled activists and scholars use the term *inspiration porn* to describe news, social media, and other content that presents a feel-good story of overcoming disability to inspire able-bodied audiences. These representations are often based in ignorance or pity (Grue, 2016).

n.d.). As a result, most of the country cannot text 911 regardless of their bodily or situational abilities. A reversal of NENA's phrase is, perhaps, called for—text if you can, call if you can't.

Furthermore, 163 jurisdictions that accept texts do so through the appropriation of TTY technology. While the FCC recommends direct IP as an implementation of texting and other NG911 services, it allows both TTY and Web browsers (used by 560 PSAPs) to serve as interim measures ("Text 911 Master PSAP Registry," 2019). In allowing one assistive technology to become the basis for another, there is a sense of both continuity and displacement. The infrastructural access for d/Deaf and communicatively disabled people is not necessarily improved, merely altered. The limitations of TTY devices—which can never receive images or emoji, for instance—are thus firmly entrenched in these interim solutions, and the emerging infrastructure remains tethered to expectations and capabilities of past technologies.

How, then, did the claim of increased access come to be seen as both reasonable and a selling point for text-to-911 services? The historical marginalization of disability in 911 infrastructure and educational materials results in a situation in which a mainstream audience might see any new technology as an improvement, having not been aware of precursors. This, of course, stems from a larger cultural marginalization of disability communities, technologies, and history. In short, ableism allows the presentation of text-to-911 as primarily an assistive technology to seem reasonable and good (even inspirational), and that framing staves off difficult questions about the degree and nature of the incorporation of new technologies into old infrastructure.

Conclusion

Nothing in this article is intended to imply that text-to-911 is not valuable or ought not be a priority. Undoubtedly, the expansion of this service will benefit people who are d/Deaf, are hard of hearing, cannot speak, or find themselves in dangerous situations. Expanding access to emergency media can be a worthy goal, particularly if it can occur alongside the interrogation and transformation of racist and ableist ideologies that often underlie law enforcement apparatuses (Cazenave, 2018; Eubanks, 2018; Herrington & Clifford, 2012; Kesic et al., 2013; Kindy, Fisher, Tate, & Jenkins, 2015). This transformative possibility, however, requires that new technologies not only serve as direct replacements (or assistive alternatives) for existing infrastructures and protocols, but allow those systems to be altered, in return. Such work requires that marginalized perspectives and needs be considered not only as problems, but also as resources for new ideas and practices.

This optimistic outcome, of course, reflects what theories of social shaping of technology of domestication would propose ought to happen with the mainstreaming of any technology. This process, however, is always a negotiation in which parties hold differential power. In the case of 911, the infrastructural and often opaque nature of the bureaucratic and technological systems works against straightforward domestication, leaving the public disempowered and unusually reliant on didactic materials from official channels, which attempt to discipline use and do little to incorporate varied cultural perspectives or critiques. The dominantly able-bodied, White, and middle-class depictions of the PSAs examined earlier speak to an assumed normalcy in 911's conception of its public. In a case like this, close readings of textual materials grant insight into not only the infrastructures, but also the politics of a larger system of mediated communication.

I have used dismediation, and an attendant infrastructural inversion, to illustrate that the promotion of text-to-911 has relied on depictions of disability to both justify adding new technologies to its infrastructure and position that as a benefit that does not require further interrogation or more substantial changes to 911 operations. Deafness and disability are assistive pretexts, preoccupations, that have (to date) crowded out other possible discussions about how text messaging practices, styles, and capabilities could alter or improve the utility of 911 for broad audiences.

As infrastructure, as communication, and as media, the 911 emergency system is fundamentally about connecting people to larger social systems, themselves ideological. The functioning of 911 is thus particularly crucial to examine from the perspectives of those whom it may not serve well, as ideologies about disability, race, and gender are carried forward in the media infrastructures that propose to serve the public in moments of emergency. When, as in this case, those infrastructures perpetuate an ideology of ability, they retain the technological politics of separateness, incompatibility, and inspiration that have long been critiqued by scholars of assistive technology and disability media. The transformation of 911 via digital media is significant, but is just a beginning of a larger and needed transformation of the relationships among people, technologies, and the infrastructures of emergency media.

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