When My Voice is not My Voice: Speaking through a Speech Generating Device

Kathy Howery, University of Alberta, Canada
Email: khowery@ualberta.ca

Abstract

A speech-generating device (SGD) is not a thing that many people have experienced. For those with severe speech impairments, however, it may be a technology giving them voice and an integral part of their daily lives. What is it like to have an embodiment relation with SGD? This article draws upon Don Ihde's insights regarding human-technology relations to explore how SGDs may act to mediate and condition the everyday lives of children and youth with speech impairments.

Keywords: Speech impairment, communication disorders, assistive technology, speech generating device

Introduction

> "This is a communication device called a Macaw," Shakila tells me softly. "And if you can learn to use switches, then you might be able to use one of these some day."
>
> I stare at the box as Shakila turns it on, and a tiny red light flashes slowly in the corner of each square. The symbols are brightly coloured, and there are words written next to them. I can see a picture of a cup of tea and a drawing of a sun. I watch Shakila to see what will happen next as she hits a switch to select a symbol.
>
> "I am tired," a recorded voice says suddenly.
>
> It comes from the box. It's a woman's voice. I stare at the Macaw. Could this small black box give me a voice? (Pistorius, 2013, p. 28)

In his autobiography *Ghost Boy*, Martin Pistorius' recalls his first encounter with a speech-

generating device (SGD). Pistorius, who was stricken with a mysterious disease as a young boy, had been left physically disabled and unable to speak. An SDG, in the form of a little black box, is promising him the amazing possibility that he might once again be able to express himself to others out loud. Its name—the "Macaw"—evokes not a mechanical black box, but a brightly coloured parrot famous for its ability to produce human sounding speech. The screen of the Macaw displays symbols, pictographic symbols, each representing a word or phrase common in everyday human conversation. By pressing the symbol with one's finger or selecting the symbol with a well-timed click of a switch, the device does exactly what all SGDs do: it *generates* human sounding speech. Is it any wonder that a young man, rendered silent for years, might stare in disbelief at the box and in awe of its ability to generate human voice via button presses?

A speech-generating device is a decidedly uncommon artifact. For most of us, speaking out loud comes naturally. Technically speaking, we generate audible speech by propelling air from our lungs through our vocal folds and articulators and thereby make our thoughts, questions, and desires known to others. In this sense, the human body usually comes already equipped with fully functioning SDG apparatus. But for people with severe impairments of speech, and sometimes despite hours, weeks, or even years of practice, this otherwise taken-for-granted ability may remain utterly illusive. Today, thanks to advances in computing and speech synthesis technologies, specialized SDGs are widely available to people with severe speech impairments. While sometimes very costly, SGDs provide the possibility of speech to children and adults who have never been able to produce intelligible speech due to congenital disability, and to those who, like Pistorius, have lost their ability to speak due to illness or injury.

Today's SGDs are computer-based systems that look very similar to a tablet computer. Indeed, some SGDs use tablet technologies as their base and some tablet technologies, like the iPad, run applications (apps) that can turn an iPad into a SGD. Whether as a dedicated system or as a tablet-based app, the basic components of a SGD include: a display that presents selectable icons, symbols and/or words, a computer program that stores and organizes the vocabulary that is available to the user, a speech synthesis program that does the work of transforming selected icons, symbols and words into human sounding audio, and finally speakers to project the selected audio speech.

The device may offer a speech impaired person an array of icons such as a green arrow to say "go" or the image of a person waving to say "hello." To expand on these one-word utterances, a person might choose the icon portraying a happy face with a balloon with the word "fun." This choice may launch a new grid with a variety of activities: go for a walk, listen to music, play catch, etc. In other instances, depending on the encoding of the language, specific icons must be touched in sequence to speak words and phrases. Regardless, the computer software then transforms the text associated with the symbol or icon into human sounding speech through the speakers housed in the device. The technical speaker then speaks for the person whose speech is impaired.

Martine Smith and Janice Murray (2016) describe communication aids, such as an SDG, as a "silent partner" in the life of a speech impaired person. Yet this partnership is far from neutral:

> When a communication aid is introduced into a communication situation, its presence changes the nature of the interaction. Even when it is not actively used within the interaction, its silent presence exerts an influence… The title of this text– The Silent Partner–has been chosen to focus attention not on a communication aid as an entity in itself, but … on how this silent partner role affords and shapes developmental opportunities over time. (Smith & Murray, 2016, p. 10)

When an SDG becomes part of a communication situation, it shifts from being simply an object, black box, or tool, to being a lived *thing* that influences and shapes the lifeworld of one who uses it. The observation that such devices serve to co-constitute the communication experience has been largely passed over in the research field of augmentative and alternative communication. Indeed, scholars in the fields of assistive and special education technologies tend to speak of devices as tools (Blackhurst, 2005; Cook & Polgar, 2008; Zabala, 2005) and primarily adopt an instrumental rather than a substantive view of the device in the life of its user. For instance, Cook and Polgar (2008), drawing on the work of Gregg Vanderheiden, define Augmentative Communication technologies as tools. They distinguish a tool, which is a technology that one must develop skills to use, from an appliance, which is a technology that provides benefits to the user independent of skill level. They classify glasses, seating systems, and computer key-guards as appliances, whereas the white cane used by the visually impaired, the manual wheelchair used by the physically impaired, and a computer joystick are understood to be tools. The white cane, the wheelchair, and the joystick take some skill to use; glasses, seating systems, and key-guards they suggest, do not. What is intriguing about their analysis is that there are no appliances for augmentative communication. An Augmentative and Alternative Communication (AAC) device, whether it is an alphabet display written on a piece of paper or a complex computer-based device such as a SGD, are all tools. The person who wishes to use an SGD must develop the skills in which to use it as a "tool."

Philosophers of technology would disagree with this narrow instrumental view of the SGDs. Beginning with the work of Martin Heidegger (1971), philosophers of technology have lifted technology out of its commonplace instrumental interpretation and have questioned its essence in relationship to human existence (Ihde, 1979). They have asked, for example, *"what things do"* as humans encounter them in their daily lives (Verbeek, 2005). Technologies, as Verbeek (2005) suggests, *mediate* between the humans that are using them and their world.

Philosophers of technology have sought to understand the meaning of particular devices in the lifeworld of the humans that come into relation with them. Reflecting on a simple jug, for example, Martin Heidegger (1971) inquired into the question of what a *thing is*, and how in its "thinging," it comes to mediate and condition our experience of the world. Phenomenological inquiries in the field of technology have sought to understand meaning of screens in our lives as we are increasingly faced with them on a daily basis (Introna & Ilharco, 2006), and how a seemingly innocuous software program such as PowerPoint can shape the experience of both teachers and students in the classroom (Adams, 2008). The field of medicine has also seen phenomenologists explore the meanings that the neo-natal isolette takes on for families as they come into relation with their premature child through and with this device (van Manen, 2012), and the moral power that ultrasound images may yield in family decision-making in the early stages of pregnancy (Verbeek, 2011). Each of these scholars question beyond what a device *is* in its merely *instrumental* or tool-like presentation, in order to attend to the *essence* of the technology or its lived *meaning*.

There have also been a handful of forays into understanding the *thingness* of assistive technologies that—like the speech-generating device—are specially created for people with impairments of their physical body. Maurice Merleau-Ponty (1962) presents the example of a blind man's use of his cane to show how an artifact (tool, technology) can extend his perception of touching beyond the limits of his body as a way of "seeing." Karl Mulderij (2000) helps us to understand how, for a child with motor disability, a wheelchair is experienced as an extension of

his or her body: mobility may become possible not with one's own two feet and legs but with one's own four wheels. Don Ihde (2007) has explored eye glasses and hearing aids as examples of technologies that help us overcome the physical in-abilities of our own bodies and allow us to (re)gain specific perceptual abilities.

In this article, I similarly ask how and in what ways SDGs mediate the relation between people and their world. What influences do these devices have on people, who must speak their thoughts out loud through a machine? In an effort to be true to the call of Edmund Husserl's "to the things themselves," I return to SGDs themselves as they appear and are experienced in the everyday lives of their users. The primary source of material for this investigation comes from a larger research project inquiring into the lived experience of young people with severe speech impairment who have become aided speakers with the use of SGDs (Howery, 2017). Nine young adults who used SGDs in their everyday lives provided their lived experience descriptions in this research project. Their stories were gathered through face-to-face interviews, online discussions, and close observation. Observations occurred over several hours and sometimes days in order to bring to light the experiences of speaking through a SGD and to gain glimpse of what it might really be like. The research adhered to ethics requirements of the University of Alberta, and informed consent was obtained for all participants.

In addition to gathering lived experience descriptions from research participants, I drew upon my over thirty years of experience as a communication specialist and educator working with children and youth who use speech-generating devices in their daily lives. I have worked in early childhood programs in specialized school settings and at a rehabilitation hospital specialized in assistive technology. These experiences have given me opportunity to encounter both children and adults who have used SGDs as a part of their AAC systems. Prior to engaging in this research, my focus had always been on finding the "right" solution for a child who has complex communication or the right "tool" to allow them to speak. While recognizing the importance of acquiring and learning to use a SGD to communicate through voice, it was not until undertaking this phenomenological research that I really considered the meaning of SGDs in the lives of the children and youth that I was supporting. Finally, to inform the larger research project, I also read several published accounts of people who have written about their own experiences with these devices. These included books written long before SGDs as we know them today existed (Creech, 1995; Nolan, 1987), as well as more recent accounts (Flieshman, 2012; Pristorius, 2012).

In attempting to provide a glimpse into how SGDs remediate the lifeworld of those who use them, I will draw on the work of postphenomenologist Don Ihde (2005, 1990, 1979). In developing a phenomenology of technics, Ihde demonstrates that (at least) four types of human-technology relations may structure our involvement with technologies: embodiment, hermeneutic, alterity, and background (Ihde, 1990). Adams and Thompson (2016) suggest these four distinct but also often overlapping intentional correlations can be used as heuristics to help understand how technologies mediate our interaction with the world.

The Voice-Giving SGD (Embodiment Relation)

A person becomes tired of struggling for words that no one can understand, after a little while that person may stop talking. For the longest time I thought I didn't need a communication device that had some kind of mechanical voice that was almost as hard to understand as I was. Then I got the Liberator... I can't tell you how much it has changed my life. I was able to ask a neighbor to unlock and open my door.

> Riding the bus with my friend Rosella, I noticed that her wheelchair was not properly fastened down, and I told the bus driver. I can now hold talks with many of my bus drivers as we drive to work and back. I can tell drivers how to find my apartment. (Staehely, 2000)

For Janice Staehely, who has spent her life struggling to produce intelligible speech, acquiring a speech-generating device was life altering. For the first time in her life, she can hold an ordinary conversation with others. The SGD transformed her from one relegated to silence to one who speaks. When enter into relation with a technology we enter into the possibility of embodied transformation (Ihde, 1990): "When we as humans use technologies, both what the technology 'is' or may be, and we, as users undergo an embodying process – we invent our technologies, but, in use, they 're-invent' us as well" (Ihde, 2007, p. 243). Ihde would describe Staehely's ability to speak with an SGD a form of *embodiment* relation, since the SGD extends the actional or perceptual possibilities of her body.

When we take up an embodiment relation with a device, we experience the world anew *through* the technology (Ihde, 1979). For example, when someone who is visually impaired uses a cane to navigate the world, they experience the sidewalk directly through the end of the cane, where the cane extends their sense of touch but also "sight." Thus the body's ability to act and perceive its world is altered or "re-invented." Is this what is happening for Janice? Is the device extending the reach of her physical body, in this case her voice? With the device, she is now able to speak, to connect with others through an audible and understandable voice. She is now able to generate intelligible speech that is now perceptible in new and powerful ways.

It may also be said that through the use of the SGD, Janice's perception of herself might have changed together with others' perception of her. Rather than being the difficult-to-understand disabled woman who may be locked in silence after numerous unsuccessful attempts at articulation, the device gives her the voice to ask for help from a neighbour, to shout out in alarm to a bus driver when her friend is at risk of injury, and to engage in conversation with people she is in contact with on a daily basis. The technology has offered her a means by which she can experience the world as a person who can speak and be understood. Upon entering into relation with the SGD, Janice may now experience the world not as something that she has to passively engage in as a silent observer, but as a world where *through* the SGD she can be an active and engaged participant.

However, in order for this transformation to occur there are a few things that the device demands. In order for the device to speak, a voice must be chosen. Selecting a voice to be used is one of the first things that a person who wishes to use a SGD must do. Usually directed by what is commonly in the computer world referred to as a "set up wizard" program, the device prompts the new user to select from one of the many "high quality" voices that are part of the program. The voices offered by the SGD can be audibly previewed as they introduce "themselves" by saying "I am…. Why not try me out with your own words?" While those invitations to select the voice sound gently inviting, one *must* be chosen. After all, the device will not speak—and therefore neither will the person who uses it—until a voice is engaged to do so.

One young woman, Gabby, told me of her experience of finding "her" voice from the myriad of voices offered by the device:

> When I got my talker, the first thing I did was to listen to the voices. I saw the one named Jill, I like that name, but it sounded old. That's not my voice and it sounds

like an old grandma. Okay. So I thought maybe I would try Samantha. But no way! She sounds like a baby! I am not a baby! Then I saw a voice that didn't have a name. It was called "13 cool girl." I listened to that voice. That was it. That's my voice: a cool kid voice. Just like mom always says I am one cool kid.

The voices offered up comes with names. Jill and Samantha—both girls' names are seemingly plausible enough for a girl who wants to find a voice that will present her to the world. There are female voices, male voices, children's voices, and teenage voices. Some SGDs even offer up "Will the Old Man." There are voices with accents: "Micah" the Texan male adult voice, "Lisa" the female Australian English voice, and "Deepa" the female Indian English voice. Some voices are identified as being happy or sad. There are even voices that have pre-assigned personalities, such as "Saul" the hip-hop speech synthesis voice, a voice that one young woman tells me she chooses when she wants to sound particularly authoritative—something that a natural speaker may do by changing the cadence of her or his voice.

As speaking persons, we may speak metaphorically of finding our voice when we are seeking a certain way or manner of expression. Yet our voice is not something that we "find," it is something that we just have. We are recognized by that voice, it is from and of our body and ourselves. For people with severe speech impairments, a computer-synthesized voice may carry similar significance. It seems very rare, indeed, that a speech-impaired person is completely without voice: they have the voice of their body. The voice that may be so slurred or slow that it is very difficult to understand by all but perhaps their closest family and friends. A dysarthric voice that may suppress the connection of expression therefore may appear meaningless for those of us who speaks with easily expressing voice.

In order to speak understandably, a person using an SGD must choose a voice of another. Once a voice is chosen, one may not only be understood, but also be projected into the world by this particular voice. The texture and the pitch of this voice may colour, embellish, and even define who they are as speakers in relationship with others. Just as our natural voice can tell much about us, so can the voice of the machine.

We may imagine this trying on voices as something akin to trying on clothing in a department store. Being presented with a wide but always-limited array of choices, we try to select "the" outfits that may project a particular image when going to work or a party. Or we may be challenged to choose the "right" colour for our hair at the salon after some tireless comparison and extended internal debates. For those with speech impairments, they may also encounter complexity when choosing from the selection of voices offered by the SGD. The questions in their mind when making a decision may include "how should I choose to project my voice," "how would I present myself to the other people," or "what is the voice that is 'just right' for me." Technically, after a while, they could switch their voice even switch between voices—not unlike what we do with our outfits or hair colours when we are bored of our choice. However, there appears more seriousness in the decision of choosing a voice: once the voice is chosen, it may be expected as more permanent attire that is less likely taken off. One is not only wearing a voice but also embracing and embodying it and letting it become part of oneself. As Ihde (1990/2009) articulates that the technologies that are in "embodiment relations simultaneously magnify or amplify or reduce or place aside what is experienced through them" (p. 79). The amplification dimension has been seen to be present in the transformational powers of the device allow for a non-speaking person to enter into the world as a speaker with a voice of their choice. However, at the same time, the voice of the SGD may also render the person less remarkable.

In recounting an experience of encountering her voice, Gabby tells us that voice offered by the device is a shared voice, the voice of another – anyone with a similar SGD may use it.

> *I was watching a YouTube video where another girl who uses a SGD was interviewing Channing Tatum. It was fun and weird at the same time. Even though she has a different device than I do, she is using the same voice as me. When I closed my eyes, it was just like I was interviewing him!*

While the voices offered up for selection by SGDs may be varied, they are also finite. It is not uncommon for two people who use SGDs to use the same voice. Indeed, many of the young female SGD users I have encountered speak with the same voice. Literally, the same voice! They tell me it is because people can understand this voice the best. The voice is one of high quality, which means it has been created with a high degree of sampling of natural human voice in its development. However, it is also a voice with no special features, no accent, no age specification, and no particular "personality." Perhaps one might think of it as a high quality "neutral" voice. This neutrality ironically makes it more "understandable" than others. It is a commonly chosen voice as Gabby's account conveys. In this sense, despite all the choice of voice, the selection may not end up being a voice that "fits" the user; instead, the decision may be dictated by what a speech impaired person is seeking from the device in the first place—the desire to be understood. As Richard recalls:

> *It was perhaps the biggest event of my life—my first talk to a group of students and educators. I had prepared my speech carefully and delivered it in what I hoped in an engaging manner. When I was done, there was polite applause and the principal thanked me for my speech. No mention of what he learned from it, which is how I had generally heard "thank-yous" done. It wasn't until I was in the hallway and the kids were going back to their classrooms that I really understood what the problem was. Two young men were walking, "Did you understand anything that guy said?" "Nope, he sounded like a robot to me. I barely understood a word." That was the last time I delivered a speech with a computer generated voice. My message was getting lost in text-to-speech translation.*

To have a voice that you can use but that no one understands may let the voice appear somewhat meaningless or, eventually, voiceless. Despite its increasingly sound quality, a synthesized voice itself may not carry all the nuances as our natural voices do when we engage in meaningful conversations. For most of us, our voice is as personal and unique as our fingerprints; the distinctiveness of our voice may remain recognizable when transformed over the telephone or other non-face-to-face conversations. Such is the power of the natural human voice. It seems that such affordance, at least with currently available technologies, may remain elusive in what is given by the voice of the machine.

The SGDs Must be Read for Meaning
(Hermeneutic Relations)

Hermeneutics involves interpretation, usually of text, but it can also involve other kinds of reading.

In terms of human-technology-world relations, "hermeneutic relations develop when the technology must be interpreted or "read" for meaning" (Adams & Thompson, 2016, p. 61). Ihde (1990) uses the example of reading the gauge of a thermometer to understand what it might feel like if one were to venture outdoors. We do not need to experience the frigid air indicated by -30 degrees Celius to know that it is cold outside. We come into hermeneutic relations with many technologies on a daily basis. By reading the temperature display, I can tell when the oven is warm enough to put the pie in it to bake. Likewise, by reading the gauge in the panel of my car, I can tell when I need to find a gas station to fill up my tank. I have learned to read my technologies so that I can use them safely, appropriately, and seamlessly.

The SGD invokes a hermeneutic demand for one who desires to enter into relation with it. Gabby tells us how she must read her device in order to find and speak the words she wants to say:

> *First I think what to say, and then I find the words in my device. Once I have constructed my message I push speak to that I can speak those words out loud.*

In order to use it to speak and to enter into any kind of embodiment relation with it, a speech disabled person must be able to read, understand, and navigate the codes by which the vocabulary stored and represented. In some instances, if the speech-impaired person is literate, the vocabulary may be stored as text—words and phrases written in the text of the language to be spoken. If the person is able to spell the words they wish to speak, they may create text letter by letter and send their text to speech software to be made audible. However, for a child or a person who has not yet acquired enough literacy skills to spell the words he wishes to say, to speak means one has to decipher and select from pictorial symbols and icons pre-coded on the SGDs. Nevertheless, the reading of the device must still be learned.

Consider Jane's story of learning to read and navigate her device:

> *One year, I got my first talking device called a "Touch Talker." My therapist came in to school to teach me how to use it. She did a great job teaching me where the icons were and what they meant. And yet, she did not teach me how to express myself with it. For example, one day, I was sent out of the classroom for drooling but what I did was sneezing out some muffin. For the life of me, I couldn't find the words to say that I had just sneezed.*

The SGD may restrict a person's ability to express oneself if the words one seeks cannot be found. What can be expressed may be dependent on accessibility of the system of the device, the vocabulary stored within, and the person's ability to interpret and find the symbolic representation of the words therein. For Jane, despite having the ability to physically push buttons and to understand the meaning of the icons, the demands of recalling where the words to say "I just sneezed" remained beyond her reach, leaving her misunderstood in a silent search for words. When speaking with a SGD one must navigate through an encoded system of language where words are storied either categorically or through meaning links. In any instance, in order to speak, one must first know what one wishes to say. In Jane's case, to say "I just sneezed," she must know how to locate each of the words in the organization of language provided by the device. While Jane knew what she wanted to say and seemingly believed that those words were stored in her device, she could not locate them in the device's encoding of language. She was still learning

where her words were and how to find them.

If we consider that a typically developing child would learn to speak long before she would be expected to read symbols or words, we may realize how interesting the hermeneutic demand of the device is. A child growing up with severe speech impairments, on the other hand, must in a very real sense learn to write, or at least to read and understand symbols, in order to speak through a SGD. Unlike a child who has learned to speak naturally and has *acquired* their words in speech and later in reading and writing, a child who uses a SGD is given their spoken words in a visual or written form. In order to speak, the SGD-child has to take the hermeneutical requirement, to navigate in and through the encoded vocabulary, and to *find* their words. The first spoken words given to these children are those that come pre-programmed in the device. In today's devices, this vocabulary pool may commonly include a few hundred or a few thousand words. Upon acquiring a device, a person must learn how the words are represented *and* where they are located in the system. Parents, therapists, or teachers may add vocabulary into the device, but without someone adding vocabulary on a daily basis, there may be a vast asymmetry between the words the device user "knows" and the words the device offers up for use (Loncke, 2014). Clearly the device demands an entirely different way of learning to speak than a naturally speaking person would experience.

The SGD May Speak for Me
(Alterity Relations)

An interesting phenomenon may be heard when talking to many people who use SGDs to communicate through voice. Often, they refer to their device as "my talker," or in some instances, even with a pet name. In the older SGD users' writings, "Libby" is commonly found referring to a particular device, The Liberator. The device itself has become imbued with human-like characteristics. It has become a *something* or perhaps even *someone* with whom they have come into relation. Ihde defines such relations as alterity relations. He describes that under some circumstances, a machine, rather than being a partial extension of oneself, can become "quasi-other"—that is the user of the machine comes into relation *with* the machine (Ihde, 1979).

In explaining Ihde's conceptualization of alterity relations, Adams and Thompson (2016) suggest that such relations occur when a technology seems to have a mind of its own, does not obey our desire, or acts in an unexpected manner. We may experience this when faced with the "blue screen of death" when our Windows computer crashes. If we use an Apple computer, the alterity relations may be experienced when faced with the seemingly endless whirring of the little colourful orb that tells us the computer is working on something and there is nothing that we can do to intervene but shut it down. We may say that the computer has spoken and we are forced listen.

In the following account an SGD seemingly shows itself as the "other" in a sudden and decidedly noticeable manner:

> *I was in a conversation with my teacher, when suddenly alarms go off on my device. Initially I was startled and soon I realized what is going on: my voice is running out of gas! There is a gas meter, as well as the everloud "doo…doo doo….doo" And I can't shut it off. I am trying to talk but my body is spazzing out on me. It is a race between the battery and me.*

"I am running out of gas. You must plug me in soon or I will no longer speak for you." The machine announces not with the gentle inviting notice that has helped one select a synthetic voice, but with a loud, body jarring alarm. Any chance of continuing to meaningfully engage in embodiment or hermeneutic relation with the device has been abruptly interrupted by the device itself. It has becomes something other than the device that allows one to speak but rather an other that demands I attend to its needs—in this case the need for power.

We may imagine an occasion where our natural voices can also be viewed as running out of steam. Our hoarse voice may tell that we have been talking too much or that we are unwell and our voice may be under some kind of strain as a result. However, it would be a strange thing indeed if our voice suddenly outright failed us. Consider when conversing happily with a friend, perhaps in the middle of a sentence, with a spasm or some other loud noise emanating from our mouths, our voice has stopped working and we are forced to be silent. Perhaps suddenly seized by a coughing fit, we are unable to continue our dialogue until the coughing ceases or until we have a drink of water. In this instance, our physical body perhaps has even become "quasi-other" as we may feel we have been taken over by the unwanted episode of body spasm. Indeed, we may even need to rest and recharge after such an incident since it has taken a toll on our physical body.

Still, for the conversational partners, a fit of coughing is something that is not unfamiliar. They may understand and likely sympathize, as it is very likely that they themselves may have had such an experience. In contrast, the loud incessant alarm of the SGD asking to be plugged in may not be so easily understandable by one unfamiliar with the SGDs. In such situations, the alarm going off may not only suggest an otherness of the device to the user but also underscore an *otherness* of the user to those who converse in their natural voice.

As well, when one is just learning to use the SGD and especially if one is struggling to make it speak as one wishes, the SGD may seem to have a mind of its own.

> *The first time I can recall using an AAC device was in 1993, when I wanted to give kind of a thank-you speech at my BA Grad party. I made arrangements to borrow the Liberator (aka "Libby"). And, because there was apparently no functional way to upload the text from my computer onto the device, I had to get someone to manually re-type my entire speech into Libby, and store each sentence under a separate key. The problem, as I found out while I was trying to deliver this speech, was that I had a very hard time keeping track of where I was in the key sequence. Consequently, I kept losing my place, repeating myself and/or skipping ahead and having to backtrack. At one point, near the end of the speech, I became so flustered that I accidentally hit the VERY LOUD SIREN on the Liberator, sending half my audience–including those who were able-bodied–into spasm! It was certainly a memorable speech! But, a triumph of AAC? Well... No.*

In this instance the SGD was relatively unfamiliar to the user and she was trying to make it work in new ways in order to deliver her speech audibly to her audience. Challenged by the hermeneutic demands of the device, she became lost in the path that needed to be remembered and followed to deliver the intended speech. The device was acting as it was supposed to—speaking as it was being directed to speak, but the user is so challenged by the interface that in the end the device becomes an incomprehensible, untamable other talking and even shouting back to her. This time, the device had the final word.

When using a device to talk, there may always be a risk that it may not speak or at least in the way exactly how you would want it to. A machine is after all just a machine. It is the device that relies on external energy sources. One's voice is silenced when the battery goes dead. One can get it back if there is a power source nearby to connect. And yet in this situation, the conversation partners must be within the room and near enough to hear as the machine is plugged into the wall.

Machines may fail. Who hasn't experienced a computer malfunction? As the saying goes, technology fails us at times of most need. At times, the failure can be deflected from us to the machine. "Stupid computer," we may complain. Or, we may announce "there must be something wrong with the software!" We may feel at loss for a more serious failure, as significant parts of our work and life have been stored in the hard drive and we may be under the risk of losing them. Yet still, the failure of the computer may not be as visceral as the failure of a talking machine. When the SGD fails, the voice is cut off, the silence surfaces. The conversation that has been carefully tuned and made possible by the machine now becomes again impossible. The limitations the machine, its character to rely on electricity or other power sources, and its potential fallacies seemingly hover in the background of its everyday functionality, reminding the human users that their speech impairment is indeed ever present.

The SGD has Much Going on in the Background (Background Relations)

Background relations described by Ihde as the technologies fading from our notice and going on around us in the background of our lives. When one enters into background relations with the technologies that are all around us every day the experience of technology is neither focal nor direct (Ihde, 1979). His examples are the pervasive technologies that while blanketing our homes seldom, if ever, come into the foreground of our experience. These include technologies such as the heating systems and the electrical systems that in essence run in the background in our homes, as well as technologies that once get turned on then require no further attention such as washing machines, dishwashers, or automatic coffee makers. If the house is very still, or when it is changing cycles, we may notice the hum of the dishwasher. However, more often than not, its work is done outside of our noticing.

Several technologies act together in the background to allow the SGD to speak for a speech-impaired person and for the most part go without the active noticing of the user. Foremost in this list is the software program that provides the language system of the device. The software that allows language to be encoded provides the hermeneutic script to present language in a systematic way so the users can learn and understand the language. The SGD has touch screen technology that allows for selection. In many instances, there are alternative technologies for those whose bodies do not afford them to point to and touch the screen. The screen must be illuminated in order for the symbols and icons to be seen and selected. The device all works via the computer that manages the bits and bytes of information and to run the text to speech software program. The speech software program generates the synthetic speech for an understanding human ear. In the meantime, electricity must be coursing through the SGD for the device to work at all. The SGD, in turn, seemingly creates a technological environment bringing together the various necessary components in the experience of speaking through a device: power, sound and words. Of course, the device cannot speak for itself; it can only speak when it is acted upon to do so, when coming into relation with a user. And yet, it could and would generate speech when touched accidently by

the user or other people. When all the technologies are working as intended (in the background) the device creates the possibility of doing what it is designed to do: generate speech.

There are times when the background technologies of the SGDs are foregrounded, not necessarily when they have failed to work but when they seem to disturb environments established for other technologies. For example, when going to the movie with a young SGD user, I was surprised that as soon as she got into the theatre, she turned her device off. After the movie was over we were excited to talk about it. She indicated to me that she would like her device turned back on—something she could not do, as the power switch was not available to her given her physical disability. Once the device was powered back up I asked why she didn't leave it on. She said that it was because of the light from the screen. People had complained about it before perhaps not understanding that her device was not an iPad. Movie theatres make much of turning off devices before the movie starts. In this young SGD user's experience that includes turning off her device. Rather than trying to explain to her fellow movie-goers that this device was not merely a tablet but her means of communication, she turned it off. The darkness of the movie theatre moved the SGD'S bright display screen from the background to the foreground of noticings.

Concluding Thoughts:
Re-visiting Embodiment

"I would contend that technologies that come…closer to being prostheses for…more complicated experience are more likely to be clumsy and less amenable to embodiment transparency" (Ihde, 2005, p. 249). In this quote, Don Ihde was reflecting on his own hearing aids as a prosthetic device—a device that was intended to help him regain his failing ability to hear. He notes that the overall experience of hearing through the device did not approach anything like optical transparency with eyeglasses. He suggests it might be because hearing is a more complex and nuanced sense than sight, the technological transparency of hearing aids with respect to human embodiment remains at best quasi-transparent (Ihde, 2005, p. 248). It is not that they are not working as they should; it is just that with any prosthetic technologies there will always remain "trade-offs" (Ihde, 2005, p. 250).

Ihde's proclamation of impossible transparent embodiment seems to especially apply to technologies designed to gain (or regain) the more complex kinds of human abilities. So what of the experience of speech and the possibility of an embodied speech prosthetic? Speaking is much more than merely producing audible words and phrases. In speaking, we come into relation with others, we whisper secrets and shout at the top of our lungs, we share the stories of our lives. As Jeffrey Higginbotham (2010), a long time researcher in the field of augmentative and alternative communication, points out, "more than any other application of this (assistive) technology, speech synthesis is charged with the responsibility to serve as a major expressive modality during social interactions….this responsibility goes beyond that of merely being a tool to convey information" (p. 51).

While the SGD offers a type of transformation, the transformation seems partial and incomplete. Embodiment of an SGD remains far from transparently achieved, for "there is, as yet, no technology that can transform thoughts held in a person's brain directly into speech" (Venkatagiri, 2010, p. 29). If such technology existed, would the device that projected those thoughts into speech truly fade from the user's notice? Would a technical speaker ever become the embodied voice for the person whose speech is impaired?

The SGD is a remarkable thing, offering voice so that one can be heard. A voice that may be used but is not truly as one's own. A voice that may be shared by others with impaired speech or indeed by anyone who may access the device. A voice that is offered if one can learn the codified language of the machine. Indeed, a voice that is offered only after one can in some measure read and write as the SGD privileges text as the pathway to talking. This is also the voice that may speak for itself when the machine malfunctions, or when the user has a slip of a finger. It seems the SGD may speak *of* the person who is using it as much as it may speak *for* them.

References

Adams, C. (2010). Teachers building dwelling thinking with slideware. *The Indo-Pacific Journal of Phenomenology, 10*(2), 1-10.

Adams, C., & Thompson, T. L. (2016). *Researching a posthuman world: Interviews with digital objects.* London: Palgrave MacMillan.

Bleeker, H., & Mulderji, K. J. (1992). The experience of motor disability. *Phenomenology + Pedagogy, 10*, 1-18.

Blackhurst, A. E. (2005). Historical perspectives about technology applications for people with disabilities. In D. Edyburn, K. Higgins, & R. Boone (Eds.) *Handbook for Special Education Technology Research and Practice.* Whitefish Bay, WI: Knowledge by Design.

Creech, R. (1992). Reflections from a Unicorn. Greenville, NC: RC Publishing.

Cook, A., & Polgar, J. (2008). *Cook and Hussey's Assistive Technologies: Principles and Practice.* St. Louis: Mosby.

Flieshman, A. (2014). Carly's voice: breaking through autism. New York: Simon & Schuster.

Heidegger, M. (1971). *Poetry, language, thought.* (A. Hofstadter, Trans.). New York: Harper Collins Publishers Inc.

Higginbotham, D. J. (2010). Humanizing Vox Artificialis: The role of speech synthesis in augmentative and alternative communication. In J. Mullennix, & S. Stern (Eds.) *Computer Synthesized Speech Technologies: Tools for aiding impairment.* Hershey, PA: IGI Global.

Howery, K. (2017). *The Lived Experience of Using a Speech-generating Device.* Unpublished Dissertation.

Ihde, D. (2007). *Listening and voice: The phenomenologies of sound.* Albany: State University of New York Press.

Ihde, D. (1990). *Technology and the lifeworld: From garden to earth.* Bloomington: Indiana University Press.

Ihde, D. (1979). *Technics and praxis*. Boston: D. Reidel.

Introna, L. & Ilharco, F. 2006. On the meaning of screens: Towards a phenomenological account of screenness. *Human Studies, 29*(1), 57-76.

Lonche, F. (2014). *Augmentative and Alternative Communication Models and Applications for Educators, Speech-Language Pathologists, Psychologists, Caregivers, and Users.* Plural Publishing.

Merleau-Ponty, M. (1964). *Signs*. Evanston, IL: Northwestern University Press.

Merleau-Ponty, M. (1962). *Phenomenology of perception.* (C. Smith, Trans.). London: Routledge & Kegan Paul.

Mulderji, K. J. (2000). Dualistic notions about children with motor disabilities: Hand to lean on or to reach out? *Qualitative Health Research, 10*(1), 39-50.

Mullennix, J., & Stern, S. (2010). *Computer synthesized speech technologies: Tools for aiding impairment*. Hershey, PA: IGI Global.

Pistorius, M. (2013). *Ghost boy*. Nashville, TN: Nelson Books.

Smith, M. M., & Murray, J. (Eds.) (2016). *The silent partner? Language, interaction and aided communication*. Albury, Guildford: J & R Press.

Stachely, J. (2000). The communication dance. In M. Fried-Oken, & H. A. Bersani, *Speaking up and spelling it out: Personal essays of augmentative and alterative communication.* Baltimore, MD: Brookes.

Van Manen, M. A. (2012). Looking into the neonatal isolette. *Medical Humanities, 38*(1), e4.

Venkatagiri, H. S. (2010). Digital speech technology: An overview. In J. Mullennix & S. Stern (Eds.), *Computer synthesized speech technologies: Tools for aiding impairments*. Hershey, NY: IGI Global.

Verbeek, P. (2011). *Moralizing technology: Understanding and designing the morality of things*. Chicago, IL: University of Chicago Press.

Verbeek, P. (2005). *What things do: Philosophical reflections on technology, agency, and design*. Pennsylvania: Pennsylvania State University Press.

Yuan, J., Liberman, M., & Cieri, C. (2006). Towards an integrated understanding of speaking rate in conversation. In *Proceedings of Interspeech 2006*, 541-544. Retrieved from http://itre.cis.upenn.edu/myl/llog/icslp06_final.pdf

Zabala, J. (2005). Ready SETT Go! Getting started with the SETT Framework. *Closing the Gap, 23* (6).