Promoting emerging new media literacies among young children with blindness and visual impairments

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Abstract

When applied to a particular disability, the terms "technology" and "literacy" take on many layered meanings. This complexity underscores the lack of empirical research on the combined areas of young children with visual impairments, emergent literacy, and assistive technology. This article specifically examines theoretical overlap between approaches to the early literacy education of children with blindness and visual impairments and the new media literacies (NML) framework (Jenkins, 2006) in order to better account for how expanding notions of literacy and pre-literacy are enmeshed with the affordances of specific technologies. After situating Braille and literacy in a transhistorical and multinational dialogue about children, technology, and innovation, I explore how the 21st century NML skill of "transmedia navigation" manifests in an ongoing methodological, philosophical, and cultural debate regarding the role of technology in potentially contributing to declining Braille literacy rates in the US. I conclude by suggesting future areas of research into best practices for promoting emergent traditional, technological, and new media literacies among children with visual impairments.

Keywords: Braille, Children with disabilities, new media literacies, visual impairment

Technological advancements have historically shaped cultural norms around many health conditions. The International Classification of Functioning, Disability and Health defines disability not solely in terms of health, but as the interaction between these mental and physical conditions and personal and environmental factors (World Health Organization, 2001). Without access to the proper materials and technologies for communication, expression, and independence, the gap widens between a person's abilities and the sociocultural perception of their disabilities.

While new digital devices and assistive technologies contribute to lowering the threshold for many young children with disabilities to lead more independent and fulfilling lives, the digital playground is not universally equipped with access for all, nor ways to participate in ways that will prepare youth with disabilities for active citizenship in our increasingly networked society. Jenkins et al. (2006, p. 3) define this "participation gap" as "the unequal access to the opportunities, experiences, skills and knowledge that will prepare youth for full participation in the world of tomorrow."

The academic, social, and emotional impact of the participation gap on young children with disabilities is immense. The lack of empirical research on the combined areas of young children, emergent literacy, and assistive technology highlights a need for richer theoretical understandings of technology and media literacy when applied to a particular disability (Buckingham, 2004; Burne et al., 2011; Floyd et al., 2008). This article specifically examines theoretical overlap between approaches to the early literacy education of children with blindness and visual impairments and the new media literacies (NML) framework (Jenkins et al., 2006) in order to better account for how

expanding notions of literacy and pre-literacy are enmeshed with the affordances of specific technologies.

As described, the new media literacies framework is less an explicit blueprint for digital technological literacy and more lifelong metacognitive skills for critical thinking. In addition to reassessing the evolving definition of literacy and the significance of media literacy education, Jenkins et al.'s (2006) white paper focuses on describing and extrapolating twelve core media literacy skills. These areas include: *play*, *performance*, *simulation*, *appropriation*, *multitasking*, *distributed cognition*, *collective intelligence*, *judgment*, *transmedia navigation*, *networking*, *negotiation* and *visualization*. In terms of early childhood education, the new media literacies framework offers large- and small-scale ways to support the social skills and cultural competencies that will enable young children of various backgrounds to be successful in preschool, grade school and beyond (Alper, 2011).

After situating Braille and literacy in a transhistorical and multinational dialogue about children, technology, and innovation, this article specifically explores how the 21st century NML skill of transmedia navigation manifests in an ongoing methodological, philosophical, and cultural debate regarding the role of technology in potentially contributing to declining Braille literacy rates in the US. Jenkins et al. (2006, p. 46) define transmedia navigation as "the ability to deal with the flow of stories and information across different modalities." I preface this discussion with a note on limitations and terminologies regarding blindness and Braille, and conclude by suggesting future areas of research into best practices for promoting emergent traditional, technological, and new media literacies in children with visual impairments.

Preface

I would like to note early on that I am not a person with a moderate or severe visual impairment, and cannot claim to write from personal lived experiences. Linguist Gunther Kress, who has written a great deal on multimodal literacy, expresses similar trepidation towards approximating a blind experience:

> As a person who has both sight and hearing I can only attempt to imagine in the most superficial ways what kind of information I take absolutely for granted in visually reading a page […] I imagine that the precision of (and preciseness about) information required for the sense of touch in the "reading" of Braille script will make the reader of that script "take up" information in quite particular ways, and think in entirely different ways about what reading is, and what abilities and dispositions it is founded on, than I do with my ability to see and hear. (Kress, 2000, p. 74)

Dynamics of power can hinge on the senses, a theme that has been particularly explored through Georg Simmel's(1921) study of the "sociology of the senses." Simmel explains that a society that overemphasises visual culture disengages the substance and meaning from other senses. Blindness is commonly associated with both concrete and metaphoric meanings in popular culture (e.g. blind faith, blind as a bat, love is blind). Disability studies and utopian literature scholar Julia Miele Rodas (2009, p. 116) writes, "Blindness is ultimately about language and, for this reason, it exists as a reflection of the culture that describes it, rather than as a representation of the condition and identity it ostensibly names." The range of human blind experiences, like the range of human visual experiences, for children and adults, is infinitely diverse.

The population of young children around the world with visual impairments is very heterogeneous. Some children are born congenitally blind, while others may have degenerative eye diseases or become blind through an accident. An estimated 19 million children globally have a visual impairment, and more than 90% of the world's 285 million persons with visual impairments live in developing countries (World Health Organization, 2011). In most of these regions, opportunities for young children with visual impairment are in residential schools in urban areas, with few children are ready to start school at the age of five. Lack of accommodations for young children with visual impairments, such as materials supporting emerging literacy, ultimately impacts national productivity, poverty rates, and quality of life, and disproportionately so for children in developing nations (Frick & Foster, 2003).

According to the 2010 American Community Survey of the US Census, there are approximately 490,420 children age 0-18 with vision difficulty in the US, and additional estimates report approximately 59,341 US children (defined as age 0-21) that are legally blind (American Printing House for the Blind, 2010). Numerous studies have reported that over half of all children with visual impairments in the US have additional disabilities (American Foundation for the Blind, 2009; 2011).

"Tactile code" does not always imply US Braille, and Braille has many symbol systems. Promoted in the UK and Australia, Moon tactile code (a simplified raised line version of the Roman print alphabet) has also been taught to children with multiple impairments or limited tactile sensitivity as a Braille alternative (McCall &McLinden, 2001). There are many types of Braille symbols for conveying various types of code. In addition to simple Grade 1 encoding, modern Braille transcription also employs contracted Grade 2 Braille. There is Nemeth Braille code for Mathematics, Braille code for musical notation, and computer Braille code. Braille has also been adapted to languages that do not use the Latin alphabet, such as Hebrew, Arabic, and Greek.

Learning Braille in any language must take into account different types of abbreviations, standards for contractions, and phonetic systems (Argyropoulos & Martos, 2006). In many languages, but not all, Braille is named for its' French inventor, Louis Braille. The name for Braille is a word translated as meaning "script of the blind" or "dot script" in Cantonese and Mandarin Chinese, Japanese and Korean, and has multiple names in German (Zurita, 2009). In this paper, the use of the term Braille refers to US English literary Braille code unless specified otherwise.

Young children, technological change, and Braille literacy tools

Technological changes for persons with visual impairments are particularly tied to historical, social, cultural, and political legacies (Aviv, 2010). Changing modalities in literacy among diverse populations of students are dramatically linked to new technologies (Tyner, 1998), particularly for children with visual impairment. The progression from rudimentary methods to the current Braille system reflects the tensions between information equity and dominant normative protocols for reading processes. Pre-Braille technologies developed in the centuries before Braille, such as woodcarvings, wax embossing and cast-iron letters (Harley et al., 1987), failed not only due to their great expense, cumbersome nature, and inefficiency, but also because they conflated tactile literacy with visual literacy.

Children with disabilities are often at the forefront of new media practices (Hartz, 2000). Students who feel frustrated by the boundaries of their abilities regularly drive the demand for technological development and challenge policy (Verlager, 2009). "Far from being left behind by media change," writes Jenkins (2008, p. 33) "the disabled are pushing ahead of the able-bodied population in their understanding of the media

changes taking place around them." It is important for young children with visual impairments around the world to learn from and model the media practices and technological proficiency of experienced others with visual impairments.

Young children can learn to accept people with disabilities just as they are, but not to accept environmental inaccessibility just as it is. For example, apps for toddlers and preschoolers are the most popular age category in the education section of the US Apple iTunes App Store (Shuler, 2012). While there are great possibilities for multi-touchscreen devices such as the iPad to support revolutionary practices in early childhood education (Takeuchi & Stevens, 2011), these technologies do not necessarily support multiple definitions of "touch." Haptic interfaces that inherently value smooth surfaces over textured surfaces do not treat all forms of touch as universally accessible. A screen that is exclusively smooth to the touch cannot support early tactile experiences with reading Braille unless other costly assistive technologies are used in conjunction.

The lack of voluntary or regulatory standards around marketing these apps and tablet computer devices as educational makes it difficult for educators, therapists, and parents of children with visual impairments to discern if mainstream products will be helpful or detrimental for their child's development. For example, Apple VoiceOver provides audible control for every menu on the iPad and iPhone in 36 international languages and Braille tables for more than 25 languages. Also, iOS 5 supports more than 30 different portable refreshable Bluetooth-enabled Braille displays (Apple Inc., 2012). These devices function without the purchase of any additional software, can be shared by other family members, and are supported by a network of technical support more expansive than most other assistive technologies. This ease of installation, low cost in comparison to other specialized devices, and the social acceptance and cultural cache of the iPad contribute to enthusiasm for the iPad as a potentially beneficial device for promoting early literacy for children with visual impairments.

However, other electronic tablets for reading, such as the Kindle Fire and Barnes & Noble NOOK Color currently remain far less functionally accessible to Braille readers (Danielsen et al., 2011). Even the iPad can be problematic. When the Apple VoiceOver functionality is enabled in the leading children's iPad e-books currently on the market, such as *The Cat in the Hat* and *Alice for the iPad*, preliminary results suggest that they are not fully designed to interact with VoiceOver (Baird & Henninger, 2011). When VoiceOver is enabled, most apps do not allow the reader to move beyond the main menu. Of those that do, there many downgraded features, including page turning, the reading aloud of mislabelled buttons, and inability to exit out of pop-up screens. These technological limitations possibly further disadvantage young children with disabilities and inhibit their literacy skill development. The extent to which Braille is socially recognised as a meaningful mode for early literacy practices is mediated by its lack of integration into some mainstream user interfaces, as well as poor design and clumsy coding by mobile app developers.

Transmedia navigation

With a greater range of tools for accessing information in the 21st century, there is a pressing need to teach all students transmedia navigation skills to judge the validity of the increasing amounts of information they are able to encounter on the Internet and the multiple means by which they are able to consume, create, and distribute information.The new media literacies framework, encompassing technical, cultural, and social-emotional skills, is particularly relevant for young children with visual impairments. Jenkins et al. write (2006, p. 47), "Participants in the new media landscape learn to navigate these different and sometimes conflicting modes of representation and

to make meaningful choices about the best ways to express their ideas in each context." A multimodal understanding of literacy for young children with visual impairments should be inclusive of transmedia navigation, including navigation between Braille, print, and aural media.

Literacy is not just as an amalgam of cognitive and linguistic skills, but a complex set of social and cultural practices (Barton et al., 2000; Lewis et al., 2007; Street, 1995). The significant literacy events for each child differ from one specific context to another: an ever-shifting "protean" interplay between different modes of language (Heath, 1982). Lankshear and Knobel (2006, p. 64) propose that literacies are "socially recognized ways of generating, communicating, and negotiating meaningful content through the medium of encoded texts within contexts of participation in Discourses (or, as members of Discourses)."

In the movement from an oral to print society, the act of writing, revising, and refining ones ideas has perhaps altered the nature of human thought (Ong, 1982). Revisiting symbols is a different process depending on whether one is rewinding a tape, flipping back a couple pages, or moving fingers back over a passage of raised Braille letters. There is cognitive value in a child's "trafficking" (Forman, 1994) through different modalities and learning more about a concept by returning to it at different points over the course of a project.

If one considers the writings of Gunther Kress, and his argument that modern literacy requires an understanding of multimodality, then locating a singular notion of literacy for a population of readers who may have multiple ways of reading is inherently highly problematic. Kress (2003) offers rich insight into human semiosis though his theory of "the materiality of modes and the human body," and has written more extensively regarding Braille than is generally acknowledged. On how sensory information channels, such as touch or smell, fundamentally impact the production of meaning, he writes:

> Each of these sensory channels is capable in principle of being developed culturally for full communication and representation - as touch is in Braille, for instance, for the sight-impaired. But beyond that, the bodilyness of mode has quite other implications, which have to be considered in a new theory of meaning. The affective affordances of sound are entirely different to those of sight or those of touch; sound is more immediately tangibly felt in the body than is sight, but certainly differently felt. A theory of meaning that is inattentive to these will not be able to provide fully satisfactory accounts of the new communicational forms. (Kress, 2003, p. 46)

Braille both *enables* meaning and is *enabled by* movement between modes, through what Kress calls "transduction" and "transformation." In *Early Spelling* (2000), he notes that Braille is an example of transduction in that it "is another instance of a translation from one representational mode to another: from sound organized as speech to touch organized as three-dimensional configurations of marks on an otherwise flat surface" (Kress, 2000). Braille also makes interpretations possible that cannot exist solely in sound or visual modalities. Writes Kress,

> The possibilities of tactile apprehension as in the reading of Braille script, differ yet again both from the perception of sound by the ear and from the perception of graphic substance by the eye. In other words, it matters, in quite fundamental ways, in what mode the "spelling" happens: it affects what can be spelled and it

> affects how it can be "taken up," perceived by its readers/viewers/sensors. (2000, pp.73-74)

Each and every child's process for assembling, deconstructing, and reassembling meaning is unique. No two children with visual impairments see in the same way (Huebner, 2003). Young children's Braille participation must be backgrounded with an understanding of emergent literacy (also known as preliteracy or reading readiness). Before infants and toddlers begin the actual task of learning to read and write, they are often exposed to incidental shapes, sounds, letters, and words during their everyday experiences. Recognising the letters M-I-L-K, the colour white, and/or the shape of the milk carton in aisles of the supermarket can help children develop a level of neurological and physical maturity required for reading, writing, and talking (Kuby et al., 1999). Besides skills and knowledge, attitudes towards literacy are also part of the reading readiness process (Whitehurst & Lonigan, 1998). Children who have been exposed to emergent literacy activities at young ages demonstrate higher rates of achievement in reading in their later school years (Senechal & LeFevre, 2002).

Although a lack of empiricism exists in understanding the specific cognitive development of young children with visual impairments (Correa & Beverly, 1990), emergent literacy for children with visual impairments is in many ways similar but also distinct from that of their sighted peers (Cheadle, 2005). Without visual observation cues, young children with visual impairments often have difficulty initiating and sustaining social interaction with their peers (Celeste, 2006), which has implications for future participation in online and offline learning spaces. Children with visual impairments usually do not have the same opportunities for incidental contact touching Braille that sighted children have with seeing print. Repeated, hands-on experience with real objects can foster connections between early Braille acquisition and spoken language (Stratton, 1996). Experiential learning with a range of reading and writing materials builds fluency and confidence in sighted and blind children alike, and may support the later development of transmedia storytelling and navigation skills.

Toys can provide young children with visual impairments opportunities for experimenting, reconfiguring, and playing with the building blocks of communication and literacy in non-visual ways. Most toys that promote Braille literacy for children with visual impairments are not out of the box ready, but require tinkering and workarounds to encourage crucial finger readiness and hand strength skills. Tack-Tiles, a Braille-based toy developed in the early 1980s by a father named Kevin Murphy trying to teach his son Braille, is an example of an innovative transmedia navigation tool promoting literacy play (Murphy & Murphy, 2000). Murphy transformed traditional Lego blocks into tactile Braille cells. He writes on the Tack-Tiles website, "I mutilated the toys of Christmas 1980 […] The cells became words and sentences on the surfaces of toy boards meant to serve as front lawns" (Murphy, 2010). This experiment in "hacking" toys is a vivid example of supporting young children's capacity to reinterpret Braille across alternative modalities.

While parents often help their sighted children learn print, most caregivers are unable to read Braille and cannot as readily offer the same types of scaffolding at home to children with visual impairments. Helping parents participate in their children's own reading by encouraging parents to learn Braille themselves is a major outreach effort (Malinski, 1996). Tack-Tiles represent a symbolic recombination of Legos, toys with major popular cultural relevance for caregivers and preschool-age children, inclusive of all abilities. The potential for constant rearrangements of the Tack-Tile units allows children to play with literacy, both independently and in conjunction with their caregivers, siblings, and extended families.

However, the price for a full set of Tack-Tiles is US $695.00, outside the means of most households (For comparison, the current price for a Wi-Fi-only 16 GB 4rd generation iPad is US $499). More financially accessible systems that families can make themselves include reconfiguring discarded plastic Easter eggs into 2x3 moveable Braille grids of cardboard egg cartons, or homemade Mancala board game sets for improving fine motor skills (de Voogt et al., 2010). These less cost prohibitive toys, as assistive technologies, support transmedia navigation skills and early literacy development. They put reading into young children's hands by remixing media into unexpected combinations outside the materials' intended uses.

Recent advances in digital desktop fabrication technologies, such as 3D printing machines, are also a means of integrating transmedia navigation and convergence. Such "critical making" (Ratto & Ree, 2012) is a way of exploring systems (technological, social, cultural) through hands-on experimentation. Designing, printing, and modifying simple handheld objects through rapid prototyping machines can potentially give parents and educators unprecedented control in developing assistive technologies (Hurst & Tobias, 2011). While 3D printing devices such as the MakerBot may allow families to become more materially and civically engaged in theory, there are also cost, assembly, and access limitations for the time being to these new, digitally-enabled ways of making, re-making, and sharing literacy assisting technologies, games, and toys.

The technological paradox of emergent Braille literacy

Making accessibility an inherent part of the design parameters of out-of-the-box technology has huge implications for the future of learners with visual impairments of all ages. New media literacies approaches to education have emerged from current debates about traditional and emerging definitions of literacy, as well as narratives of deficit and decline in mediated and technological contexts (Cope & Kalantzis, 2009; New London Group, 1996; Westby, 2010).The 21st century NML skill of transmedia navigation particularly manifests in the issue of declining literacies and a much-debated US "Braille literacy crisis."

Approximately ninety per cent of legally blind children in the US cannot read or write Braille (American Printing House for the Blind, 2009). Concerns of a "Braille literacy crisis for children" in the US (Johnson, 1996) are based on reports that there has been a steady decline in the number of Braille readers since the 1960s, even after the passage of the Individuals with Disabilities Education Improvement Act (Miller, 2002). The IDEIA mandates that all children with moderate and severe visual impairments be taught Braille unless it is determined to be inappropriate by the child's Individualized Education Program team (National Federation of the Blind, 2009).

The "Braille literacy crisis" is far too complex to be understood without analysing the larger context of special education in the US (Spungin, 1996).The illiteracy rate figures are controversial and linked to various potential causes, though there is no clear consensus. Among these reported causes are: negative societal attitudes towards blindness and Braille (Federman, 2005; Hehir, 2002; Riccobono, 2006); difficulty in finding sufficient numbers of teachers knowledgeable in Braille (Pogrund & Wibbenmeyer, 2008); a strained educational system unable to ensure that students with disabilities have the same access to educational materials as their typically developing classmates (Schroeder, 1989); and a rise in the number of multiply-impaired children with visual impairments who are non-readers (Rex, 1989).

Modern technological advancements have also been singled out a prime cause of declining Braille literacy rates. The National Federation for the Blind, the largest membership of visually impaired people in the US, describes what the organisation calls

"the paradox of technology." While new technological advancements are making Braille easier to produce and disseminate than any other time in the history of the code, simultaneous advances in the availability and accessibility of audio books and screen reading technology may be counteracting that effect. A greater reliance on speech output and print-magnification technology is often viewed as a substitute for Braille (Aviv, 2010; Spungin, 1989).

In primary school classrooms, Braille may be viewed as a technological barrier (Connell, 2003), as Braille books take up tremendous shelf space. Costly print book transcription into Braille requires a great deal of time and a high level of skill, contributing to disputes on the utility of the Braille code (Hartz, 2000). The Braille edition of *Harry Potter and the Deathly Hallows* (the first popular children's book in history to be distributed in Braille and print simultaneously) is 1,100 pages, weighs twelve pounds, stands over one foot tall, and extends to ten volumes (Oleck, 2010). In a culturally diverse classroom, English and Spanish Braille versions of *Harry Potter* would be double the cost, space, and weight.

Another perspective though on "the paradox of technology" is that increased access to text *in general* for children with visual impairments promotes a love of literature that transcends modalities and sensory experiences (Cooper & Nichols, 2007; Verlager, 2009), and promotes transmedia navigation, storytelling, and learning. Audio e-books are increasing the range of literary materials that are available to young readers, are being released around the same time as print versions if not earlier, and are providing a lower cost than large volumes of Braille texts (Danielsen et al., 2011).

Technological advances are also making tactile Braille a more attractive option to users with visual impairments. Some educators and students find that due to the linear and unsearchable nature of audio books, reading Braille actually allows for a more active process and the ability to control pacing (Hartz, 2000). Printed Braille may be gaining traction as scanners and software increase the speed of Braille book production. Tactile refreshable Braille displays also complicate the "paradox of technology" because they greatly increase portability and anytime/anywhere learning.

Children with visual impairments and their families utilise a wide range of assistive technologies for reading and communication, though many around the world lack the resources and guidance for making critical choices (Wong & Cohen, 2011). As defined in the US Individuals with Disabilities Education Improvement Act of 2004 (IDEIA), assistive technology is "any item, piece of equipment, or product system, whether acquired commercially or off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of a child with a disability" (Individuals with Disabilities Education Improvement Act, 2004).

Assistive technology may promote small and large motor skills for daily life; support cognitive skill development; modify the presentation of media for learning, reading, and communicating; facilitate social interaction with peers, caregivers, and educators; and increase opportunities for play and recreation. Many researchers, educators, and therapists conceptualise assistive technology as a continuum, with expanded parameters for no-tech, low-tech, and high-tech devices and strategies (Mistrett et al., 2005; Weikle & Hadadian, 2003).

Caregivers of young children are often caught in middle of the Braille literacy debates and left confused about best courses of action and best practices for assistive technology use. There is a lack of data on literacy outcomes for Braille readers who are dual-media readers (Lusk & Corn, 2006). Some educators insist that a choice must be made early on between either print or Braille, and that only one reading medium should be used so as not to burden a child with extra work or isolate them from classmates. Other research suggests that learning both modes simultaneously may pose confusion

and problems due to differences in spelling, punctuation, and capitalisation (Holbrook & Koenig, 1992).

Learning to read Braille is not necessarily appropriatefor every young child with visual impairments. There are many considerations when assessing forms of assistive technology for reading and communication. These factors include developmental readiness, activity specificity, environmental preparation, and the scaffolding of experiences with lower degrees of technological devices. Geographic, economic, and temporal constraints, as well as cultural considerations and the values of families and communities are also important considerations (Cooper, 2009). Distinctions among children's level of visual function (moderate visual impairment, severe visual impairment, and blindness), as well as the age of onset of vision loss also influence the range of assistive technology to which a child is introduced.

There may be a widening of the participation gap if children with visual impairments with the capability to be dual or multiple media users are not given the opportunity to develop those social and cultural competencies. Students with low-vision, particularly those with degenerative visual impairments, are especially at risk for not receiving appropriate Braille instruction while some level of sight remains (American Printing House for the Blind, 2009). Children who do not fall neatly along a print/audio/Braille axis have a right to agency and respect in their modes of literacy learning (Caton, 1991). Without exposure to all options, children with visual impairments might not have the opportunity to practice the skills and ethical choices necessary to become active consumers, creators, and distributors of cultural material.

Many educators contend that young children with visual impairments need to learn how to manage a digital/non-digital balance. Just as long as sighted people find pencils and pens more than convenient than computers on multiple occasions, young children with visual impairments need to have the option to learn to write with low-tech items such as a slate and stylus (Jacobson, 2002). FamilyConnect, the online, multimedia community created by the American Foundation for the Blind and the National Association for Parents of Children with Visual Impairments, cautions against children becoming reliant on one tool, instead using a variety of tools for developing life skills (FamilyConnect, 2011).

Conclusion

Societal concern over declining, dormant, and dominant literacies is fundamentally about multimodalities and transmedia navigation. The Braille literacy crisis debate speaks to a larger dialogue about the changing landscape of literacy in the lives of all young children. Tension lies not only in determining the "official" version of literacy to be taught in schools and homes, but the possibility that more than one necessary literacy exists.

As early childhood literacy scholarship is increasingly global in scope, future research into young children's "techno-literacy" practices can better integrate emergent literacy among young children with visual impairments (Beck, 2002; Marsh, 2004). For example, there is very little information available on how blindness factors in to raising young children in an international, bilingual or multilingual home (Vasiliauskas, 2009), a research area that merits further consideration. Future research should also expand web accessibility studies to app accessibility for young children with visual impairments.

Assistive technologies are an important component of early intervention, preschool, and early elementary special education. As there becomes a wider spectrum of assistive technologies available to children with visual impairments, the new media literacies framework enables reflection on the affordances of these dynamic tools and

critical inquiry into the transparency of these technologies, including the iPad, in fostering multimodal literacy and transmedia navigation skills. While there is much to unpack regarding the causes of the "Braille literacy crisis" in the US, locating a singular notion of literacy within a population of early readers who may one day employ multiple modes of reading (e.g. Braille, large print, audio books) is inherently highly problematic.

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Biographical Statement

*Meryl Alper*is a Ph.D. student in Communication at USC Annenberg. She graduated magna cum laude from Northwestern University in 2005, double majoring in Communication Studies and History. She also holds a certificate in Early Childhood Education from UCLA. Prior to her graduate studies, Meryl interned in the Education & Research Department at Sesame Workshop and worked as Research Manager for Nick Jr.Her main area of research is young children's evolving relationships with old and new technologies, and in particular, the social, cultural, and historical construction of early literacy, as well as assistive technologies for children with disabilities. Currently, Meryl serves as Research Assistant on a children's transmedia storytelling project at the USC Annenberg Innovation Lab, and is a Research Associate with The Joan Ganz Cooney Center at Sesame Workshop. She has been published in the *Journal of Early Childhood Literacy* and the *Journal of Children and Media*, and has a forthcoming book chapter on children and convergence culture in the *Handbook of Children, Adolescents and Media*. Her research has also been featured in *Wired Magazine*.

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Promoting emerging new media literacies among young children with blindness and visual impairments. Author(s): Meryl Alper Volume: 4 Issue: 3 Year: 2012. YouTube viral videos and HIV prevention among African-Americans: Implications for HIV prevention. Author(s): Jocelyn D. Patterson | Khiya J. Marshall Volume: 4 Issue: 3 Year: 2012. An education in Facebook.Â Copyright, digital media literacies and preservice teacher education. Author(s): Michael Dezuanni | Cushla Kapitzke | Radha Iyer Volume: 2 Issue: 2 Year: 2010. Critical reading of a text through its electronic supplement. For parents of children with visual impairments. Text Size. Smaller Type.Â As a parent, you have hopes and dreams for your child who is blind or visually impaired. The hope of most parents is that their child will be healthy and happy and continue to grow and thrive, learning the skills that will prepare him or her for an independent life as an adult. And as a parent of a child with limited vision, you know there will be times when you have questions, and you are not sure what to do. It is a common saying that a baby doesnâ€™t come with a handbook.Â Your understanding of your childâ€™s development as a young child with visual impairment or blindness didnâ€™t prepare you for this. Strategies youâ€™ve used before are not working.