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## Toward Writing Skill With A Toddler Who Is Blind Using A Braille Writer

Paige Renee Maynard

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**TOWARD WRITING SKILLS WITH A TODDLER WHO IS BLIND USING A  
BRAILLE WRITER**

A Masters Thesis

Presented to

The Graduate College of  
Missouri State University

In Partial Fulfillment

Of the Requirements for the Degree

Master of Science in Education, Special Education

By

Paige Maynard

May 2016

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# **TOWARD WRITING SKILLS WITH A TODDLER WHO IS BLIND USING A BRAILLE WRITER**

Department of Counseling, Leadership & Special Education, College of Education

Missouri State University, May 2016

Master of Science in Education, Special Education

Paige Maynard

## **ABSTRACT**

The topic of emergent literacy development in children younger than 36 months has not been extensively researched, while the topic of emergent literacy development in children who are blind and younger than 36 months has even less empirically-validated literature. Within the umbrella of emergent literacy lie emergent writing skills, emergent braille writing skills, emergent reading skills, and emergent braille reading skills. The purpose of this study was to understand how the presence and utilization of a braille writer in the home of a young child who is blind fits into the development of the child's emergent literacy repertoire, as part of an in-home early intervention program. The research, completed over a period of four months, used qualitative case study methods with one participant. The research demonstrated the emergent literacy strategies on which the family was coached, as well as the strategies they implemented with their child. At the beginning of the study, the child, aged fourteen months, was delayed in emergent braille writing skills. At the end of the study, the child, aged seventeen months, had established developmentally appropriate emergent braille writing skills. Other essential themes that arose included family and early interventionist empowerment, and accessible emergent literacy experiences for the child.

**KEYWORDS:** infant, toddler, emergent literacy, braille, early intervention, emergent writing, braille writer

This abstract is approved as to form and content

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May 2016

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## INTRODUCTION

Unlike parents of children who are sighted, the parents of babies and toddlers who are blind are not fortunate to be surrounded with accessible reading and writing experiences in their child's early years. In her five years working in early intervention for infants and toddlers who are blind, this researcher has discovered that the majority of families on her caseloads do not find out their child is blind until he/she is around three to six months old or even older. Upon learning of their child's blindness, the family works to obtain and create braille materials for them, often, while becoming literate in braille usually to a functional level. In contrast, parents of sighted children are generally fluent in reading and writing print, and thus can feel confident in providing early literacy experiences to the very young child who has vision. In order for the child who is blind to acquire identical experiences to the sighted child, there is a need for the entire family to have access to braille materials and tools for writing braille. Typically, these specialized materials are less accessible than print materials (Craig, 1996).

In the course of her work with these children and their families, the researcher noticed that many youngsters who have visual impairments seem to be delayed in emergent reading and writing skills. The researcher has also noticed that potential braille readers seem to have even more developmental delays in the areas of emergent reading and writing. This observation is supported by Craig (1996), whose ground-breaking research indicates that children who read braille alone are less likely to have literacy experiences and to initiate them than children who are dual media readers.

Additionally, many of the families of children who are blind with whom the researcher has worked who had been previously served by other early interventionists did

not possess braille writers in their homes when they became part of her caseload services. Furthermore, it became apparent that the families who were receiving in-home intervention services for the first time did not access braille writers prior to receiving early intervention services. Thus in these abstract situations the children could only explore “writing” through the use of crayons or other common instruments. However, such a process conferred minimal to no advantage to the youngsters in terms of written communication and related experiences. In other words, while the children may have gained experience in listening to their family or by way of talking about the act of writing, the listening actually provided little meaning to them because they were unable to experience the true process of writing. Thus, the researcher was motivated to carry out this study based on the fact that many young children who are blind also experience delayed emergent literacy skills because of the absence of appropriate writing tools in the home environment.

### **Rationale for the Study**

The investigator has also seen that it can be difficult for families to obtain tools for writing braille. Within the history of education for the blind, Teachers of the Visually Impaired (TVI) traditionally advocate for children to master certain fine motor skills before being introduced to the braille writer (A. Hughes, personal communication, 2014). In contrast, within the early childhood community, the philosophy about providing young children with tools for writing is drastically different. This community believes that early exposure builds the child’s understanding of the conventions of reading and writing. In fact, many emergent literacy studies that have been reviewed assume that the presence of reading and writing materials are a prerequisite to literacy development and for

demonstrating emergent writing skills (Gerde, Bingham, & Wasik, 2012; Pinto, Bigozzi, Accorti Gamannossi, and Vezzani, 2012; Rowe & Neitzel, 2010). The *Infant Toddler Environmental Rating Scale – Revised* (Harms, Clifford, & Cryer, 2006) recognizes that access to writing tools has an impact on the development of the child. For example, very young children in a quality infant and toddler classroom which follows the revised scale are encouraged to make marks on paper with crayons and other media. These quality environments provide babies and toddlers with opportunities to finger paint, and to engage in other early writing activities. This experimentation is part of the developmental sequence, and leads to more appropriate behaviors with writing tools. The researcher believes that children who are blind are children first, and that the principle of experimentation which leads to developing braille literacy skills must hold true for them as it does for sighted children.

For several decades in the history of blindness, the braille writer was perceived as a delicate tool because it was easily damaged by changes in humidity and/or damaged in the process of being transported from place to place (A. Hughes, personal communication, 2014). Currently, the American Printing House for the Blind’s online store advertises the Perkins Light Touch Braille as both durable and reliable (American Printing House for the Blind, 2014), a solution to the problem of the fragility of former models. This new development appears to be a solution to the problem of the fragility of former models of the mechanical writer. In any event, this researcher believes that denying children braille writers on account of their fragility is unacceptable, and such practice contradicts the current early childhood emergent literacy philosophy and practice (Dote-Kwan & Hughes, 1994).

The non-provision to families of braille writers by the Kentucky state early intervention program assistive technology department provided the catalyst for the current investigation. The assistive technology department had argued that there was no empirically-based evidence to support the notion that providing a family of a child who is blind with a braille writer helps the child foster developmental skills. In fact, it was only recently that the Kentucky Instructional Materials Resource Center began to provide braille writers using federal quota funds - thanks to the advocacy from administration at Visually Impaired Preschool Services, located in Louisville, Kentucky. The Kentucky School for the Blind Charitable Foundation also provides braillewriters to people who are blind across the state.

However, in a recent effort to obtain braille writers for infants and toddlers, the researcher encountered barriers from these organizations. Among other things, these entities contended that there was no evidence to support the efficacy of using braille writers for infants and toddlers, and that children who are in formal literacy programs would find these specialized writing tools more beneficial. These limited opportunities in Kentucky to acquire needed tools for basic literacy experiences may also characterize services in other states, and this situation warrants further investigation by researchers in the field of visual impairment. It is anticipated that the present research in Kentucky will help illuminate the difficulties so infants and toddlers who are blind will be provided quality in-home literacy activities and experiences throughout the nation.

## **Purpose of the Study and Research Hypothesis**

The purpose of this project was to understand how the utilization of a braille writer in the home of a young child who is blind fits into the development of the child's emergent writing skills. The investigation was undertaken as part of the early intervention program approved for the child and the family.

The investigator formulated four research questions to guide the study. These research questions are stated below:

1. What coaching strategies have been adopted for a family of a young child who is blind with a braille writer to develop emergent writing skills in the home environment?
2. What strategies is this family utilizing routinely to foster the young child's emergent writing skills?
3. What kinds of emergent literacy instruction does a young child who is blind with a braille writer receive daily within the natural environment?
4. To what degree does a young child who is blind with a braille writer exhibit emergent writing behaviors at home?

It is hypothesized that a young child who is blind who utilizes a braille writer at home will demonstrate emergent writing behaviors when the family also receives and implements the literacy strategies.

## **Research Design**

This research will use case study methods with one child who is blind aged 12-36 months, whose degree of vision loss indicates his or her need for braille, and who has no additional diagnoses or disabilities. This child and his or her family will have been involved with in-home early intervention with a TVI or teacher certified in early childhood with training in intervention with children who are blind.

It is also essential that this child and the family have access to a braille writer in their home at all times. The family will be extensively interviewed and observed in order to understand how the braille writer itself fits into the implementation of literacy interventions. This research design will allow for a holistic understanding of how the braille writer is used for early intervention, thus paving the way for the researcher to understand the child's emergent writing behaviors.

### **Significance of the Study**

There is a critical need to understand how early intervention in emergent literacy impacts the development of emergent literacy skills. It is anticipated that the project will increase professionals' knowledge and understanding of how accessible writing tools fit into the development and promotion of braille literacy skills. The information derived from the study may influence the intervention strategies of other early interventionists, so they are better prepared to assist families on their caseloads. More fundamentally, the conclusions drawn by the study may provide research-based evidence about the use of the braille writer to funders regarding efficacy of braille writing tools for toddlers and infants in home environments.

The outcomes of this project will also be useful in the field of blindness and low vision. Practitioners will increase their awareness that utilization of appropriate writing tools may permit young children who are blind to meet developmental milestones, thereby laying the foundation for successful academic and vocational pursuits.

According to McCormick and Haack (2011), "Early Literacy Individual Growth and Development Indicators are moderately correlated, in many instances, with the reading outcomes in kindergarten through 2nd grade, including overall reading

performance at the conclusions of 2nd grade” (p. 29-40). The utilization of the braille writer in the home of the child who is blind could help the child develop these indicators, which would put him or her on a trajectory toward success in reading early in school. Furthermore, if the use of the braille writer is connected to this elementary reading achievement, it may also be connected to high school graduation rates. Hernandez (2012) stated that “about 16 percent of children who are not reading proficiently by the end of third grade do not graduate from high school on time, a rate four times greater than that for proficient readers” (p. 4).

Finally, the researcher will share the results of the project with philanthropic grantors of braille assistive technology. These benefactors may be more willing to provide very young children who are blind with braille writers. Thus, the effect of increased accessibility of technology that addresses emergent writing may include strong emergent writing skills in children who are blind as they enter preschool. The study will also attempt to bridge the differences in current practices and attitudes about the provision of writing tools between professionals in the field of blindness and professionals in the field of early childhood education.

### **Assumptions and Limitations**

It will be assumed that the family involved in the study gives honest and open information about their involvement in their child’s emergent literacy development. The study also assumes that the observations of the child involved in the study are representative of his or her regular functioning.

This results of the study will have limitations, through the non-ability to determine causality or correlation of the presence of a braille writer on emergent writing

behaviors in children who are blind as a whole. The format of the study does not allow for isolating the writing interventions using the braille writer, as it holistically looks at emergent writing skills in the context of many literacy interventions. Lastly this study does not dictate the types of intervention strategies used and implemented by the families involved. Some strategies in themselves may be more effective than others for facilitating emergent writing development.

### **Definition of Terms**

1. Accessible emergent literacy experience – child observed or shared writing event which enables the child who is blind to understand the conventions and foundations for reading and writing. Examples include when a caregiver narrates what he or she is writing in print, when a caregiver writes in braille and allows the child to explore it, when a caregiver and child write and/or pretend to write together, when the caregiver and child communicate through verbal on nonverbal means, and when a caregiver reads to or with a child.
2. Emergent braille literacy – the period of time before formal braille literacy instruction in which a young child is immersed in braille reading and writing, and begins to form an understanding of the conventions of writing.
3. Emergent writing – the period of time before formal writing instruction in which a child learns that marks on paper convey meaning.
4. Family - “two or more people who regard themselves as a family and who carry out the functions that families typically perform. Poston et al. (2004) said that these people may or may not be related by blood or marriage and may or may not live together (as cited in Turnbull, Turnbull, Erwin, Soodack, and Shrogren, 2011). Further, “family”, as more specifically outlined by the researcher, is defined as any person or people who regard themselves as the child’s family and are directly involved and invested in the child’s welfare.
5. In-home early intervention – the consultative process of a trained professional who works with the family of an infant or toddler in the home in order to facilitate the emergence of developmental skills for the young child.
6. Natural environment – the regular places in which learning occurs within daily routines, where children without disabilities can also be found learning within the context of routines. Examples include home, childcare centers, parks, and restaurants. Non-examples include clinics and lab settings.



## **REVIEW OF RELATED LITERATURE**

In this chapter, the investigator reviews concepts germane to emergent print literacy, namely, how researchers have studied how the written letter emerges, as well as early childhood experts' views on exposure of young children to tools for making marks on paper. Next, the chapter describes research on interventions for emergent literacy in children who are delayed. Given the dearth of literature on emergent braille instruction, the researcher considers it relevant to embark on a discussion of general braille instruction. Finally viewpoints on providing print and braille readers with tools for creating marks on paper are examined.

### **Emergent Print Literacy**

According to Pinto, Bigozzi, Accorti Gamannossi, and Vezzani (2012), writing development begins at the time a child is able to use the writing implement. In fact, the access to writing tools gives way to the first symbolic representations that a child makes, which are pictures (Levin & Bus 2003). A child's pictures progress to recognizable letters. When children first call their scribbling writing, they are in scheme 1 (Levin & Bus, 2003). Within scheme 1, children progress to single forms (such as approximation of a circle), and then small single forms. Though these drawings do not resemble conventional writing and look more like pictures, children often describe them as writing (Levin & Bus, 2003). Later, in scheme 2, a child's drawings look more like conventional writing, gaining linearity, showing segmentation into letter-like units, with some of the units looking consistently different (i.e., the child uses consistent vertical lines, circles, and triangular-like figures) (Levin & Bus, 2003). Later, in the symbolic scheme 3, the child's writing has progressed past drawing into conventions that many would consider

writing, such as copying letters, invented spelling, and spelling phonetically (Levin & Bus, 2003).

Strategies for developing writing skills in young children in the classroom environment have been well-documented. Gerde et al. (2012) encourage early childhood educators to facilitate children to write in the context of their play and to provide access to materials in each learning center. They also encourage professionals to model reading and writing throughout classroom routines and learning activities. Though the authors did not address home literacy activities, the principles may carry over to reading and writing experiences within a child's home.

Insomuch, both writing and play appear to be filtered through general underlying interest orientations. Rowe and Neitzel (2010) conducted a case study with 11 children through extensive videotaping, field notes, participant observation, photography, and artifact collection to gain an understanding of the relationship between a child's style of play and the way that the child engages in writing during play activities. An application of the findings of the study is that a child who takes a large interest in pretend play may use writing as a means to create a pretend menu for a restaurant that they pretend to run, as part of the play sequence. The age and developmental level of each of the children who were studied was such that they understood the conventions and tools for writing, so that they were able to use it for meaningful tasks. For example, within the study, one child took an interest in using writing for purposes within dramatic play; she created mail when she pretended to be a mail carrier. This child needed the understanding that pencils are used to write in order to create the mail.

Emergent literacy instruction is important because success in writing in the early elementary grades is associated with established skills in late emergent writing. Pinto, Bigozzi, Accorti Gamannossi, and Vezzani (2012) found that children who were better able to write letters and symbols at a young age were higher achievers in orthography (skills in spelling, hyphenation, capitalization, word breaks, emphasis and punctuation) in their early elementary years. The study assumed that each of the children had an understanding of the conventions and tools used for writing, as each child being studied has these early emergent writing skills. Because the students' performance was measured by their written work, the researchers assumed that the children had knowledge of the tools for writing.

### **Interventions for Emergent Print Literacy**

Some children may have delays in emergent literacy skills and need early intervention in order to meet their developmental milestones. Hilbert and Eis (2013) sought to look at the benefits of an emergent literacy program implemented by the classroom teacher, as opposed to other previous research which looked at the expertise of speech therapists or other specialists. They found that regular classroom teachers were able to facilitate at-risk children in developing literacy skills for which the children had deficiencies. These skills included phonemic awareness, alliteration, and rhyming. The study gives way to the idea that given the appropriate materials, even the more broadly trained professional can have an impact on the child. This principle may carry over to the consultative model of early intervention. For example, once the parent is coached on emergent literacy strategies by the expert, interventions may be carried out by the parent. If the parent is provided with tools for helping their child write, and training on how to

use them, then the findings may transfer to parents who are taught to use a braille writer with their child.

A case study by Neumann, Hood, and Neumann (2012) described emergent literacy interventions implemented by another broadly trained professional: a mother. They found that the focus child was provided ample opportunities for literacy, including access to writing materials and parent-child interaction with them in writing. Parent scaffolding was highly effective in developing his writing skills. The results may carry over to the home environment of a young child who is blind.

### **Practices for Braille Instruction**

Compared to the plethora of studies on emergent print literacy, there is little research on emergent braille literacy. However, Koenig and Holbrook (2000) conducted a Delphi study to find the amount of time that braille students, including children birth to three, should receive literacy instruction. Professionals in the field of blindness and low vision recommended that “early intervention is essential to literacy acquisition. The more we work with young kids at this age, the better. Also, parents need to learn how to provide similar experiences when the professional isn't there” (Koenig & Holbrook, 2000, p. 686). Additional recommendations are that “children need daily stimulation to develop concepts and prepare them for literacy skills. A teacher can provide ideas [and] suggestions and model activities anywhere from twice a week to twice a month. Parents and other family members can follow the teacher's example on a daily basis” (Koenig & Holbrook, 2000, pg. 686).

The landmark ABC Braille Study, by Emerson, Holbrook, and D'Andrea (2009) found that students who were introduced early to contracted braille were more proficient

readers than those students who were taught uncontracted braille. Early intervention in braille reading literacy was effective for developing high level literacy skills. These studies did not, however, look at the types of experiences that the very young child needs. The child may need experiences with braille materials and the tools used for writing braille.

Emergent literacy is undoubtedly an important facet of the braille education of a very young child. A case study written by Zabelski (2007) documented the significance of early intervention for braille literacy, as she looked at the early years of emergent braille instruction for both her and her blind daughter, from her daughter's graduation through higher education. The issue studied by the author was her daughter's braille acquisition, academic success, and self-confidence. Zabelski (2007) determined that her daughter's success in school and career were as a result of early intervention in the area of braille instruction. The author observed that a family's level of advocacy can have a large impact on the child's future success, as it can provide the child with the resources and services that he or she needs in order to succeed.

Drezek (2014) wrote about emergent braille literacy instruction in "Practice Note: Emergent Braille Literacy with Move, Touch, Read" saying,

the motivation for literacy rests in interest and curiosity about the world and confidence that information usefully can be gained through symbols. Interest, knowledge, and confidence are nurtured through a child's encounters with objects, activities, and people that result in increased abilities to communicate and represent experiences in words. (p. 105)

Furthermore, "Parents and teachers can assist young braille students by understanding the prerequisites for braille literacy just described; explicitly encouraging the full range of required developmental skills" (Drezek, 2014, p. 105).

## **Tools and Experiences for Writing**

There is much research about writing development in young children; however, the researcher found no published studies devoted to writing development in children under two years of age. The researcher comprehensively reviewed several sources, e.g., the Missouri State University Meyer Library Databases, the library at Visually Impaired Preschool Services in Louisville, Kentucky, as well as the library at American Printing House for the Blind in Louisville, Kentucky. The lack of study likely indicates that the emergent literacy skills which emerge from birth to age three may occur through incidental learning, which many professionals may take for granted. Skills such as reaching for, grasping, and scribbling with a writing implement happen in sighted children incidentally. If these very young children are provided with everyday materials for exploring writing and experience observing others write (which happens within the context of daily routines), they naturally take an interest in writing.

There is even a smaller amount of research on emergent braille literacy in children who are blind, and the researcher found no published research at all on emergent braille writing in young children who are blind. There was also no published research on emergent braille writing in children who have blindness related to Septo-Optic Dysplasia (the diagnosis of the participant in this study).

Most research focuses on the acquisition of reading skills. Literature for very young children focuses on “readiness” skills for reading and writing, and exposing children to reading experiences. For example, Ryles (1994) states that

sometimes blind and visually impaired children come to preschool or kindergarten with less than average strength in their hands and fingers. This is the age the pre-reading and reading and writing activities should formally begin for children.

Even if your child is not a future tactile reader, it is wise to spend time playing with him or her to develop arm, hand, and finger strength. (p. 15)

Lowenfeld, Abel, and Hatlen (1969) reference what is now known as emergent reading. They explain their position that exposure to braille should begin before formal schooling: “There is no reason why the books a parent may read to his blind preschool child should not also be available in braille and be placed in the hands of the child. He is not learning to read, but he is learning that there are tactual forms of words which have meaning” (p. 93).

The lack of study may be due to the size of population and recent emergence of both early intervention and the idea of emergent literacy. Professionals have suggested that a very young child who is blind should have braille books in the home for reading (Drezek, 2014; Emerson, et al., 2009).

Many practitioners have suggested that very young children under three years old should not be allowed to use a braille writer. In a written interview, Ann Hughes, TVI since the 1970s states that

When I first entered the field, children did not touch a braillewriter until they were school-aged. It was thought that there are a number of prerequisite skills that need to be in place before ever touching a braillewriter such as finger strength, dexterity, knowledge of which dots make which letters, etc., and ‘braille scribbling’ was a big ‘NO-NO’ because braillewriters seemed to break so easily (especially Lavender brailers).

However, the early childhood community assumes the presence of tools for writing in all of its studies on emergent writing. There is a discrepancy between the view on exposure and opportunity to explore tools for writing between early childhood professionals and professionals who work with children who are blind.

## **Summary**

Children who are print readers progress through a continuum of skills as they develop the ability to write pictures and symbols which have meaning. These children need to have access to tools for writing, and be provided with opportunities throughout the day to engage in writing experiences, especially through play.

Children who have deficits in literacy skills can receive interventions through their general education providers, and catch up on developmental skills. In contrast, there is little research on the development of braille writing skills in children who are blind, save for the general statement that they need frequent exposure to braille writing. Because of the high cost and delicate nature of previous models of the machine, service providers did not make braille writers available to infants who were blind. Instead, TVIs focused on helping the child develop fine motor skills in preparation for the time when a braille writer would be available, and provided them with braille books for emergent reading.



## **METHODOLOGY**

For the purpose of this empirical research, the investigator used a case study approach to permit a comprehensive understanding of the formation of emergent braille literacy skills. The case study model is a dynamic process with many variables. According to Gaye et al. (2009), case study research is “the in-depth investigation of one unit (e.g., individual, group, institution, organization, program, or document)” (p. 600). A case study approach was deemed to be the best method for the project based on the question to be explored, i.e., “How does the braille writer fit into emergent literacy development?”

The complexity of family dynamics and the nature of the acquisition of emergent braille literacy skills, including emergent braille writing skills, brought the researcher to question how the braille writer fits into this multifaceted process. Because the research question involved the word “how?” the best way to approach the study was through case study research, in which the child and her family were studied through observation, interview, videotaping, and collection of artifacts. Through analysis of the data collected, the researcher would make an effort to understand how the braille writer fits into emergent braille literacy acquisition in the child’s home environment.

### **Study Setting**

The site of the study was the natural environments of the child who was chosen as the research subject. The natural environment here refers to the home, grandparents’ houses, and the grocery store. These community places were selected to allow for the child to be provided with the real experiences which foster literacy skills within the context of daily life.

The sociocultural context of the family was one that provided the child with much love and support. Within the home lived the child and her mother and father. The mother and father worked out their work schedules so that one of them could be home to care for and teach her. The mother and father also had support from their parents, who cared for and taught the child when the parents' schedules overlapped. The family expressed their beliefs about raising the child, including having high expectations for her, just as they would for a sighted child. The involvement and attitudes of the family had an impact on the results of the study, as described in chapters IV and V.

### **Participants**

It is generally believed that purposive sampling can provide the opportunity to “select a sample believed to be representative of a given population” (Gaye et al., 2009, p. 134), hence the choice of purposive sampling as the selection procedure. The amount of observation and interview that took place in order to understand how the braille writer fits into the development of emergent literacy was extensive. Therefore, the researcher thought it best to spend time studying one single child and family in-depth.

The participant was a child aged 12-36 months and the child's family. The family here is defined as “two or more people who regard themselves as a family and who carry out the functions that families typically perform. Poston et al. stated that these people may or may not be related by blood or marriage and may or may not live together” (as cited in Turnbull et al., 2011, p. 8). In simple terms, this researcher's view is that “family”, may constitute a family or group of people who regard themselves as the child's family and are directly involved and invested in the child's welfare. Specifically for the child, additional criteria for inclusion in the study were established including a

diagnosed visual condition with a visual field of 20 degrees or less and/or a best corrected visual acuity of 20/400 or worse. Also, the child would be one who received early intervention services from a TVI with training in early childhood education or a teacher certified in early childhood with training in the field of blindness and low vision. Other qualifications included that the child's family had a braille writer which stayed with the child and family.

In order to obtain a participant for the study, the researcher contacted teachers of the visually impaired who provided early intervention services via professional networking. A TVI, who also was certified in early childhood education, identified a prospective child and her family.

At the beginning of the project, the researcher ensured that the child and family met the criteria described above. The child was aged 14-17 months through the duration of the study. The child's visual acuity was "light perception", with a diagnosis of Septo-Optic Dysplasia. The child received early intervention services from a generalist who specialized in early childhood, a TVI, and beginning at the midpoint of the study, an occupational therapist. The child had also received a braille writer from the TVI three weeks before the beginning of the study. The child's family included her mother and father.

### **Ethical Considerations**

First, the research was submitted and approved by the Institutional Review Board (IRB) at Missouri State University. This study was reviewed in accordance with federal regulations governing human subjects research, including those found at 45

CFR 46 (Common Rule), 45 CFR 164 (HIPAA), 21 CFR 50 & 56 (FDA), and 40 CFR 26 (EPA). The study number designated by the IRB was 15-0487. The researcher followed the IRB protocols throughout the conduct of the project.

As part of the Informed Consent, the researcher provided the participant with information regarding “the nature of the study and any possible dangers that may arise as a result of participation” (Gaye et al., 2009, p. 21). This information can be found in Appendix A. An aspect of informed consent includes informing the subject of the study of possible dangers that may come about as a result of participation. These dangers included both the stress and anxiety of the time spent participating in the project and the general vulnerabilities for allowing a researcher access into their daily routines.

Next, the researcher consulted with the family to determine times of day for data collection that would be least invasive to them. These times of day were determined to be the periods that they were already receiving therapy visits. Thus, the researcher completed the data collection during these early intervention home visits.

### **Data Collection Procedures**

The researcher collected data over a period of approximately four months. The data set was composed by making copies of the home visit service logs generated by the TVI; these logs were compiled during the project period. The child’s Individualized Family Service Plan (IFSP) was also used as an artifact. Further data was collected in the form of approximately hour long observations bimonthly, which occurred during early intervention visits by the developmental therapist, TVI, or occupational therapist. The researcher was usually a non-participant observer, though participant observation was utilized as well. During these observations, data was recorded. Additionally, the

researcher utilized a protocol during each observation, and completed unstructured interviews about the events observed, which were included in written field notes. The family was also instructed to video segments of their daily routines once per week for approximately 30 minutes.

The data from the research was kept in the form of a double entry journal, in which direct observations, facts, quotes, etc. were indicated in one column. Reflections upon these observations were written in an adjacent column.

### **Instrumentation**

The instrument of gathering project data was varied and was comprised of observations, interviews, and an adapted developmental assessment created by the investigator. Observational data was collected mostly through non-participant observation. The researcher utilized this type of observation in order to collect robust data on the child's emergent writing skills. In a conscious attempt to establish rapport and trust with the family, the researcher sometimes resorted to using participant observation technique. For example, at the initial phase of the project, the researcher engaged in play with the child, and utilized the braille writer in this process.

Videotaping was utilized for data collection purposes. To this end, the family received from the investigator a video camera. It was conceptualized that the camera would be utilized when the researcher could not physically be present in the home. The family was informed that it was not required for the family to be engaged in using the braille writer during the videotaping process, because some emergent literacy skills and strategies could be implemented beyond the use of the braille writer.

Over the course of the study, the subjects filmed themselves two times for approximately 8 minutes per video. Field notes were taken in the form of a double entry journal while the researcher watched the videos. The data provided from the videotaped sessions yielded sufficient information for triangulation with other pertinent data that were collected.

Significantly, the researcher used additional protocols during observations and viewing of the videos. The supplementary resources were derived from literacy sections related to writing of *The Oregon Project for Visually Impaired and Blind Preschool Children* (2007) (Appendix B) and literacy sections related to writing from *The Carolina Curriculum for Infants and Toddlers with Special Needs* (2004) (Appendix C). Both instruments are typically used for measuring the development of young children. These protocols helped the researcher to describe and pinpoint specific emergent literacy behaviors and skills in the child. Since many of the skills within the assessments are visually based for print writing, the researcher added braille equivalent skills that were similar to the print skills.

During interviews the researcher also used both structured and unstructured methods. Unstructured interviews allowed the researcher to ask questions that arose through observations during the home visits. On the other hand, structured interviews were used in order to elicit answers to specific questions (this self-constructed instrument is contained in Appendix D). The use of this instrument permitted the researcher to expand upon the research questions. The variables addressed within the research questions are all variables that may be associated with a young child's emergent literacy development.

The home visit service logs of the child's TVI also facilitated the data collection phase of the project. For example, these logs allowed the investigator to examine strategies that were shared for general emergent literacy, as well as information related to techniques for incorporating using braille and tactile skills into the daily routines of the child. Overall these logs proved useful for the written reflections related to the research questions.

### **Role and Responsibilities of the Researcher**

During the data collection phase of the study, the researcher observed and listened. This approach was implemented primarily to maximize the collection of data as much as possible. However, when it was deemed desirable, the family received appropriate intervention strategies. For example, the TVI focused mainly on providing the family with strategies for exploring braille and textures. These included encouraging the family to provide experiences for the child to explore many objects, thus developing tactile skills for discriminating texture. The TVI also provided the family with brailled books, and encouraged the family to read them together. The TVI had less experience with providing strategies for using the braille writer in the home, so the researcher provided most of the coaching to the family on using the brailler to foster emergent literacy skills. Strategies were shared through caregiver coaching, in which a strategy was described to the family, then modeled. Then the family was encouraged to practice implementing the strategy while the researcher observed, so that the family could ask questions, and the researcher could clarify the use of the strategy. Once the family expressed that they felt comfortable with the strategy, it was released to them to use on their own. For example, the researcher coached the family to explore the use of the

braille writer in the presence of the child, and to allow her to tactually explore the machine while they wrote with it.

Because data was taken and emergent writing strategies were shared while the developmental therapist and occupational therapist were providing home visits, collaboration with them by the researcher occurred in the form of allowing the therapists to observe the researcher coach. The researcher also answered their questions about the braille code and how to work the braille writer. The researcher also answered their questions about how to use the braille writer in the context of their discipline specific interventions. For example, the developmental therapist asked whether it would be a good idea to use the braille writer to develop the skill of finger isolation.

### **Data Analysis**

In its raw form, the data was very long and wordy, consisting of many observations and reflections of those observations, as well as service logs, and notes from interviews. First, as described in Gaye et al. (2009, pp. 447-457), a short memo for each piece of data was written, which enabled the researcher to understand the holistic nature of the information collected. Next, she sorted through data and work to code it by themes that seemed to emerge as she reviewed it. The data was triangulated in order to assure validity of the study. The researcher did this by ensuring that each of the themes was supported by multiple data collection methods. This data analysis developed into a case study because the examination helped illuminate the topic of emergent braille writing skills. Grounded theory also allowed the analysis of the research to generate theories related to the function of the braille writer within the family's routines and within the



child's development of emergent braille literacy skills. These theories are discussed within chapter V.

## **DATA ANALYSIS PROCEDURES**

The timeline for the data collection continued until there was enough triangulation within and between methods to establish themes which answered the research questions.

These themes included:

- family/early interventionist empowerment (FEIE)
- accessible emergent literacy experiences (AELE) (the family reported these increased since utilizing the braille)
- development of emergent literacy skills/behaviors of the child (DELS)
- functional implementation of strategies by the family for promoting emergent braille literacy skills in the child or coaching of a strategy by the researcher or TVI (FISCS)

### **Family and Early Interventionist Empowerment**

A total of 26 items were recorded which reflected family and early interventionist empowerment. The term “item” was defined by the researcher as the individual moments, statements, or small observations that were taken from the data. For example a note taken from viewing the video included “mom sit with child between open legs on floor; braille in front of them”, and was counted as an item. There were 22 recorded items from the field notes from face to face visits which fell under the category of family and early interventionist empowerment (FEIE). There were 0 items from the field notes from videos which fell under the theme of FEIE. There were 4 recorded items from the service logs of the TVI which fell under the theme of FEIE. There were 0 recorded items from the IFSP which fell under the theme of FEIE.

In terms of overall FEIE at the beginning of the study, the mother first stated in an unstructured interview that she had a fear of learning braille; however, on receiving the machine and with instruction, she became motivated to learn the writing skill. She also

reported that she was excited for the child to begin the learning process. The father reported in the same interview that he spent some time practicing writing on his own.

At the middle and end of the study, the mother reported in an unstructured interview sharing knowledge about braille with her family and friends. She stated “Once you start doing it (braille), you figure it out.” Furthermore, she reflected on the child learning braille in formal education settings: “I think it will be easy for her to learn.” Throughout the study, the mother also regularly asked questions about how to work the braille, including the loading of paper.

In an unstructured interview, she also brought up the topic of the child’s access to written communication in public places by discussing the access to print and braille. For example, she realized that the signs on the shelves and price tags on goods in grocery stores are in print, and thus inaccessible to the child. She suggested approaching the management of the grocery store to request if she could be permitted to place braille labels on signs of items that she normally buys so the child could be exposed to braille in the shopping process. The mother also described during an unstructured interview how she had bought other supplies to provide tactual learning to the child, such as a quilling kit. During a discussion with the developmental therapist about obtaining a waiver which would provide the family with funds for additional therapies, childcare, and equipment, the mother expressed the idea of using the funds to purchase a braille writer, because the braille they used for the study was borrowed from Visually Impaired Preschool Services. The mother and TVI also reported in unstructured interviews that once the study began, the grandparents wanted to obtain a braille for their child to use when visiting. Lastly,

the mother reported in unstructured interviews that she was practicing writing her name and the child's name with the braille.

The items that reflect empowerment in the early interventionists who served the child involved the developmental therapist (the interventionist who addressed global developmental needs) and the TVI. During a home visit observed by the researcher, the developmental therapist presented the idea of placing braille labels on the child's toys, and for using the braille for the improvement of finger dexterity. For example, she suggested that the braille writer could be used to help the child develop the fine motor skill of finger isolation. The TVI showed empowerment by regularly providing the family with braille paper and braille books.

### **Accessible Emergent Literacy Experiences**

There were 39 recorded items from the field notes from face to face visits under the category of accessible emergent literacy experiences (AELE). There was one recorded item from the field notes from the videos under the category of AELE. There were 2 recorded items from the service logs of the TVI under the category of AELE, making a total of 42 AELEs.

The types of AELE that were recorded in the data varied. Some included when the family, TVI, or researcher used the braille with the child nearby and listening or when both the adult and child touched the braille at the same time. They reported in an unstructured interview that they would often practice using the braille. As they practiced, the child often walked to them and reached out. They reported then directing her hands to the braille to read it together. They stated that the child responded by smiling and jumping up and down, indicating her excitement. The child's excitement

showed to the researcher that during this accessible emergent literacy experiences, she was building a foundational understanding of the communication aspect of the written word, and of the joint attention that reading and writing together bring. Furthermore, the family stated they encouraged the child to tactually explore the parts of the braille to gain a better understanding of each part. For example, some parts that were explored were the sound of the warning bell toward the end of each writing line, and how the paper is inserted. According to the mother in an unstructured interview, the child loved to initiate the ding sound made by the warning bell.

Some other accessible emergent literacy experiences observed and recorded involved verbal and nonverbal communication without the use of the braille. For example there were several instances of the child imitating sounds her mother made (i.e., sniffing, animal sounds). Cues about the location of objects in relation to the child's hands, observed to be given by the family and the early interventionists were also considered AELEs. These types of fine motor skills are essential for later braille proficiency.

Some AELE involved emergent reading of braille books that had been labeled in the house. The family used tactile and auditory symbols to promote understanding of various concepts within the home. These included holding the child's hands out to the water of the shower to help her understand the source of the sound and the bath that the water represented, as described to the parent in a structured interview about their daily routines. The child extended her hand to the sound of the water, and participated in the literacy experience by getting into the shower upon hearing its auditory symbol of running water. The child was also consistently presented with AELE during play with a

push button toy which the mother and the researcher had jointly labeled. The child also had AELE when she explored braille books at her discretion. During the face to face data collection the researcher observed the child initiating touching brailled books and turning their pages on numerous occasions, showing her emerging understanding of the use of books.

### **Development of Emergent Literacy Skills/Behaviors of the Child**

At the beginning of the study, the child, aged 14 months, had established the adapted item one (braille equivalent: scribbles spontaneously with the braille writer) from Selected Items and Researcher Created Adaptations from *The Oregon Project for Visually Impaired and Blind Preschoolers, 2007* (Appendix B). From Selected Items and researcher created adaptations from *The Carolina Curriculum for Infants and Toddlers with Special Needs, 2004* (Appendix C), the child had established skill a (braille equivalent: marks paper with braille writer) was denoted a 12-15 month skill. Skill b (braille equivalent: scribbles spontaneously with the braille writer) was denoted a 15-18 month skill, was also established. Via family report, the child did not exhibit any of these skills before she received the braille writer, when she was aged approximately 12-13 months. The child was observed by the researcher in the face to face data collection periods to approach the braille writer on her own. The child made marks on the paper by pressing the buttons. Both of the parents also described the child during her play as she built an understanding of what the braille writer does, and how it makes marks on paper. They told the researcher in both structured and unstructured interviews that they saw that the child loved to approach the brailler on her own, pressed the keys of the brailler, and then pulled the paper out of brailler. The researcher interpreted these behaviors with the

braille writer as the child building an understanding that the braille writer does has an impact on the texture of the paper, and that it is a tool for making tactile marks.

At the end of the study, the child aged 17 months had established braille equivalents for items one (braille equivalent: scribbles spontaneously with the braille writer), two (braille equivalent: presses keys repetitively, stopping and starting), and three (braille equivalent: uses different key combinations when using the braille writer) from Selected Items and Researcher Created Adaptation from *The Oregon Project for Visually Impaired and Blind Preschoolers, 2007* (Appendix B). The child had also established adapted items a (braille equivalent: marks paper with the braille writer) and b (braille equivalent: scribbles spontaneously with the braille writer) with emerging establishment of item d/e (braille equivalent: imitates pressing the keys of the braille writer) from Selected Items and Researchers Created Adaptations from Selected Items and researcher created adaptations from *The Carolina Curriculum for Infants and Toddlers with Special Needs, 2004* (Appendix C). Skill a was denoted a 12-15 month skill, skill b was denoted a 15-18 month skill, and skills d and e were denoted 21-24 months skills. Due to its nature (finger painting), skill c was not adapted by the researcher into a viable braille equivalent.

Specific evidence to support the acquisition of the aforementioned skills came in the form of an observed interaction between the occupational therapist and the child during the face to face data collection. The occupational therapist sat with the child in her lap and with the braille writer in front of them. The occupational therapist began pressing the keys of the braille writer and said “Let’s type.” The child then reached out to the braille writer and pressed the keys herself. This imitation of typing with the keys shows the child’s emerging ability to imitate writing using the braille machine.

The mother also provided an anecdote during an unstructured interview about herself and the child playing with the braille together. The mother was loading and unloading paper from the machine by rolling the paper roller in and out. The child chose to become involved with the activity, and also grasped and imitated rolling the paper roller. During this exchange, the child demonstrated joint attention about how the braille writer works, which is a foundational understanding for developing further emergent literacy skills.

### **Functional Implementation of Strategies by the Family for Promoting Emergent Braille Literacy Skills in the Child or Coaching of a Strategy by the Researcher or TVI**

Throughout the course of the study, the TVI and the researcher collaboratively coached the family on a total of 12 emergent literacy strategies. These strategies were formulated for the needs of the individual family and child. They were intended for the family to use within daily routines, so no specific time would be spent during the day as “braille time”, but rather for literacy practices to be infused throughout the day. The family implemented 100% of these strategies. These strategies were:

- Read braille books together
- Allow child to tactually explore the braille writer itself
- Braille labels on braille label paper for common objects in the house and place them on the common objects (the family chose “table”, “toys”, “wall”, “eat”, and some letters, numbers, and words on a push button toy)
- Call attention to braille labels placed on common objects in the house when child is physically near them by encouraging her to touch them
- Keep the braille in a room where the child spends time



- Keep the braille in an accessible place in the room
- Braille labels on braille label paper and place them into board books
- Run the child's hands over braille when she is near it (i.e., a braille book, braille signage in public, brailled labels at home)
- Explore writing with the braille together during play time
- When adults are writing in print (such as paying bills or making a grocery list), set the braille next to the child
- While using the braille with the child, sing a song while typing with the keys. Sing the song again while reading the written braille.
- Allow the child to explore braille when and how she chooses

### **Items that fit multiple themes**

Some items from the data fell under multiple categories, and their significance is discussed in the next chapter. Twenty-four (24) of the 42 total items fell into both the theme of accessible emergent literacy experiences and an emergent literacy skill observed, reported by the family, or recorded via observation of the researcher. Therefore 57.1% of the accessible emergent literacy experiences occurred within the observation, report, or recording of an emergent literacy skill in the child. For example, the anecdote told by the mother in which the child approached the parents as they were practicing writing and when she showed an enjoyment of having her hands run over the braille written by her parents was both AELE and DELS.

One item fell into both the theme of functional implementation of strategy or strategy shared and family and early interventionist empowerment (FISCS). Therefore 3.4% of the items marked under the theme of FEIE all fell under the theme of FISCS; 8.3% of the strategies coached were also items that fell under the theme of FEIE.

Fourteen (14) items from the data collection fell under both the themes of AELE and FISCS. Therefore 33.3% of AELE data were also categorized as FISCS; 100% FISCS data were also categorized as AELE. For example, data collected about the mother and researcher around the home was evidence of implementing an emergent literacy strategy.

Four items from the data collections fell under both the themes of DELS and FISCS. Therefore, 33.3% of FISCS themed items were also categorized as DELS. Three items from the data collection fell under the following three themes: DELS, AELE, and FISCS. One significant item that fell under all of these three themes was from an unstructured interview with the mother. She discussed that the family implemented the strategy of making the braille writer accessible to the child at all times by putting it on the floor in both the living room and in her bedroom. This provision of the braille writer to the child at all times created an accessible emergent literacy experience in which the child demonstrated building an understanding of how the braille writer works by initiating pressing the keys until the warning bell rang. In this one experience in the child, all of the themes worked together to promote emergent literacy skills, so that the child would be provided with the same experiences that a sighted child takes advantage of on a regular basis.

Table 1 shows a breakdown of the data that fit multiple themes. The numbers in Table 1 indicate the amount of items that fit both the theme in their intersecting row and column. The “-” in a position indicates that data was invalid for the particular combination or already shown in another position.

Table 1: Analysis of Items within Research Data that Fit Multiple Themes

Theme	FEIE (26)	AELE (42)	DELS	FISCS (12)	DELS and FISCS (12)
Family and Early Interventionist Empowerment (FEIE) (26)	-	-	-	-	0
Accessible Emergent Literacy Experience (AELE) (42)	0	-	-	-	3
Development of Emergent Literacy Skills/Behaviors of the Child (DELS)	0	24	-	-	-
Functional Implementation of Strategies by the Family for Promoting Emergent Braille Literacy Skills in the Child or Coaching of a Strategy by the Researcher or TVI (FISCS) (12)	1	14	4	-	-

## DISCUSSION

At the beginning of this project, it was hypothesized that “a young child who is blind who utilizes a braille writer at home will demonstrate emergent writing behaviors when the family also receives and implements the literacy strategies.” Data obtained from this project support this hypothesis. As highlighted in Chapter IV, the family noted that the child was not engaging in any emergent writing behaviors before receiving the braille writer. Within a relatively short period of exposure to the device, the child was able to achieve equivalent literacy milestones for her age. Throughout the study, the child’s emergent writing skills improved, and these skills remained within her age repertoire.

It should be noted that there is possible bias in the selection of the emergent writing skills in the assessment writing procedures. This may be attributable to the fact that, due to the non-existence of normed emergent braille writing skills, the researcher used her knowledge of infant and toddler development to compile and write the equivalents for the writing skills that were addressed. Bias might have also occurred in family reporting of the child’s skills, as families sometimes over or under estimate their child’s abilities.

One limitation of the findings pertains to the fact that this study was completed with only a single subject. Thus, an expanded research on understanding how the utilization of the braille writer fits into emergent literacy development should be completed with multiple subjects. This expanded focus would provide deeper understanding and the ability to generalize findings.

On the professional level, this project assisted the researcher to gain greater insights into how the braille writer fits into the development of emergent literacy skills of a young child. For example, during the data collection phase, it was observed that each time the development of an emergent literacy skill or behavior was documented, such behavior or skill occurred within the context of an accessible emergent literacy experience. This trend indicates a likely causality of the DELS by the AELE within the child's natural environment. In a logical sense, the child cannot show mastery or even practice emergent literacy skills without the media and tools necessary to demonstrate the skill. In other words, the child was not able to demonstrate whether she was capable of scribbling on the braille writer unless she actually had a braille writer to scribble on. Further research is warranted on the topic of accessible early literacy experiences and their impact on the development of emergent literacy skills and behaviors in children who are blind, so that there can be generalization of correlation or causality between the DELS and AELE in a larger population.

The researcher gained additional insights about the way that family and early interventionist empowerment fit into the development of emergent braille writing skills. In helping the child to obtain the emergent braille literacy skills, conversations about helping the child gain such skills almost always included comments from the family and the therapists that reflected empowerment. It is noteworthy that the project not only supported the hypothesis regarding the development of skills in the child, it brought to the forefront the significance of family and provider attitudes about the capabilities of the child. In particular, and by the end of the project, the mother showed a significantly positive change in attitude about braille literacy. Bandura, Barbarnelli, Caprara, and

Pastorelli (1996) found that “Parents’ beliefs in their efficacy to promote their children’s intellectual development and the education aspirations they hold for them were both influential factors in the academic process” (p. 1218). The mother’s change in attitude about braille correlated with the child’s literacy achievement in this context. There is a need for further study to possibly generalize a correlation between parent attitude about braille and the skills of the child who is blind in a larger sample size.

It should be noted from Table 2 that 100% of the functionally implemented strategies (FISCS) cross-counted as Accessible Emergent Literacy Experiences (AELE). There was a full correlation within the child’s natural environment that the FISCS always indicated that there would be an AELE. This means that each time that an emergent literacy strategy was implemented, it provided an opportunity for an accessible emergent literacy experience. Therefore, an AELE, associated with the FISCS, was a likely cause of the emergence of literacy skills (DELS) within this particular child in this particular situation. If further research confirms a correlation between AELE and DELS, a possible indirect correlation between strategies implemented and emergent literacy skills could be generalized with a larger population.

An extended observation of the research findings includes the fact that the child used the brailler for several months. However, because of her age, she did not always use the brailler as intended. The researcher accumulated data that indicated that the child sometimes kicked the brailler when she was actually supposed to be using it. Despite this “abuse” of the device, the brailler did not suffer any damage.

Collectively, the accumulated data indicated that the family implemented all 12 of emergent literacy strategies on which they had been coached. The TVI and the

researcher were able to devise emergent literacy strategies for the family to use which did not interrupt daily routines, but became part of the routines themselves. This implementation was especially true for the child's play time. When the mother was asked which strategies were difficult to implement, she frankly and sincerely stated "None. I enjoy being involved with [my child] learning braille." This was a noteworthy statement because it showed that the mother's attitude showed that the strategies had become part of her daily life, and that she had embraced emergent braille literacy for her child. Since the strategies that were shared with the family were specific to the family's needs, they may or may not be applicable to other families. What is significant here is that emergent braille literacy strategies built into the family's daily routines may be more likely to be effectively implemented and viewed in a positive light by the family themselves.

### **Limitations**

As discussed in chapter I, the research design did not allow for causality to be generalized between the utilization of the braille writer and a child's emergent writing skills in a larger population. The project was more holistic in nature, with emergent literacy skills being observed in whole, and not in a clinical way. There was much data taken in the form of how the child related to the brailler, but this was possibly due to researcher bias.

A second limitation of the research was due to the format of the study. It did not allow for isolating the writing interventions using the braille writer, as it holistically looked at emergent writing skills in the context of many literacy interventions. The literacy interventions the family was coached to use sometimes utilized the braille writer,

and sometimes did not. These types of strategies also contribute to the limitations of concluding about full causality between the use of the braille specifically and the development of skills.

The strategies shared themselves may constitute a form of limitation. For example, this study did not dictate the types of intervention strategies used and implemented by the family. Some strategies in themselves may have been more effective than others for facilitating emergent writing development. Also, there may have been strategies that the researcher and the TVI could not suggest to the family which would have been more effective in helping the child develop emergent writing skills.

### **Recommendations for Future Practice and Research**

There are practical recommendations emanating from this research project. First, accumulated data in this project showed that the braille writer can and should be used within the context of a literacy-rich environment for a young child who is blind. Thus, by providing a braille writer to demonstrate the acquisition of writing skills, the child can gain emergent literacy experiences and develop emergent literacy skills within the natural context.

Second, on the basis of the foregoing benefit, practitioners in the field of blindness and related fields should not entertain any apprehensions regarding the braille writer breaking down when used in the home setting. Rather, these professionals should consider the braille as a useful device which, when utilized in conjunction with other emergent literacy tools and interventions, can potentially facilitate emergent writing development in young children.



Finally, future research should be carried out to determine how the community of practitioners can better understand this important subject. The expanded investigation should involve many participants and their families in home settings throughout the country.

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## APPENDICES

### Appendix A

#### Informed Consent Letter

May 1, 2015

Dear Family:

This letter is to kindly invite you to participate in a study to be conducted by Visually Impaired Preschool Services and Missouri State University. The purpose of the study will is to understand how the use of the braille writer fits into a child's development of reading and writing skills in the child's home setting. The study will involve observing your child and family. The study will also involve interviewing members of your household. Your child's IFSP (Individualized Family Service Plan) will be reviewed, as well as other information from your child's early intervention records. Your family and child will be observed twice per month for approximately one hour periods, and videotaped approximately once per week for 30 minutes.

Please note that the participation of your family in this study will have no impact on the early intervention services you receive.

Before you make a final decision about your child's and your participation, please read the following about how the information will be used and how your child's rights as a participant will be protected:

- Participation in this study is completely voluntary. You, your family and/or your child may stop participating at any point without penalty. However, I seek your full cooperation in this study.
- The information you provide will be kept confidential and anonymous. Results may be shared but will not contain names or other identifying information.

If you agree to take part in this study, please sign the form below and return by June 30, 2015. Keep the top of this letter for future reference. You can contact me if you have questions or concerns about your family and child's participation at 502-498-2931. You may also contact Dr. Paul Ajuwon at Missouri State University at 417-836-5397. Thank you very much for your time and consideration.

Sincerely,

Paige Maynard  
Developmental Interventionist and Classroom Teacher of the Visually Impaired  
Visually Impaired Preschool Services

Complete for child who receives early intervention:

I, \_\_\_\_\_ (print parent/guardian name), agree to allow my child, \_\_\_\_\_ (print student name), to participate in the study about the braille writer and reading and writing skills through Visually Impaired Preschool Services.

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

Complete for other children under 18 years of age who are under your guardianship and live in your home:

I, \_\_\_\_\_ (print parent/guardian name), agree to allow my child, \_\_\_\_\_ (print student name), to participate in the study about the braille writer and reading and writing skills through Visually Impaired Preschool Services.

I, \_\_\_\_\_ (print parent/guardian name), agree to allow my child, \_\_\_\_\_ (print student name), to participate in the study about the braille writer and reading and writing skills through Visually Impaired Preschool Services.

I, \_\_\_\_\_ (print parent/guardian name), agree to allow my child, \_\_\_\_\_ (print student name), to participate in the study about the braille writer and reading and writing skills through Visually Impaired Preschool Services.

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

For each family member age 18 or older:

*I hereby certify that I have read and understood the above consent document, and have been given the-opportunity to ask and have answered any questions I have now or may have in the future. As shown by my signature below, I consent to participate in this study, and to allow data from my file to be used in this-study in the confidential manner described above.*

\_\_\_\_\_  
Printed name                      Signature      Date

\_\_\_\_\_  
Printed name                      Signature      Date

\_\_\_\_\_  
Printed name                      Signature      Date

\_\_\_\_\_  
Printed name                      Signature      Date

## **Appendix B**

### **Selected Items and Researcher Created Adaptations from *The Oregon Project for Visually Impaired and Blind Preschoolers, 2007***

1. Scribbles spontaneously with a crayon (fine motor section, one to two years)  
Braille equivalent: scribbles spontaneously with the braille writer
2. Changes from scribble to stroke and back again (fine motor section, one to two years)  
Braille equivalent: presses keys repetitively, stopping and starting
3. Finger paints, making vertical, horizontal, and circular motions (fine motor section, two to three years)  
Braille equivalent: uses different key combinations when using the braille writer
4. Imitates horizontal line (vision section, two to three years)  
Braille equivalent: imitates pressing individual braille writer keys
5. Imitates circle (vision section, two to three years)  
Braille equivalent: imitates pressing individual braille writer keys
6. Imitates cross (vision section, two to three years)  
Braille equivalent: imitates pressing individual braille writer keys
7. Copies a horizontal line, vertical line, and a circle (vision section, two to three years)  
Braille equivalent: imitates pressing individual braille writer keys



## Appendix C

### Selected Items and researcher created adaptations from *The Carolina Curriculum for Infants and Toddlers with Special Needs, 2004*

Age (months)	Curriculum Sequences	Date:	Date:	Date:	Date:	Notes:
<b>21. Visual-Motor Skills</b>						
12–15	a. Marks paper with writing implement					
15–18	b. Scribbles spontaneously					
18–21	c. Fingerpaints with whole hand					
21–24	d. Imitates vertical stroke					
	e. Imitates shifting from scribble to stroke and back					
24–30	f. Imitates horizontal stroke					
	g. Pretends to write					
30–36	h. Copies a circle with a circular scribble					
	i. Snips with scissors					
	j. Makes continuous cuts across paper					

- a. Marks paper with writing implement (12-15 months)  
Braille equivalent: marks paper with braille writer
- b. Scribbles spontaneously (15-18 months)  
Braille equivalent: scribbles spontaneously with braille writer
- c. Fingerpaints with whole hand (18-21 months)  
Braille equivalent: none adapted by the researcher
- d. Imitates vertical stroke (21-24 months)  
Braille equivalent: imitates pressing the keys of the braille writer
- e. Imitates shifting from scribble and stroke and back (21-24 months)  
Braille equivalent: imitates pressing the keys of the braille writer
- f. Imitates horizontal stroke (24-30 months)  
Braille equivalent: imitates pressing the keys of the braille writer
- g. Pretends to write (24-30 months)  
Braille equivalent: pretends to write with braille writer

- h. Copies a circle with circular scribble (30-36 months)  
Braille equivalent: attempts to imitate pressing individual keys on the braille writer

## **Appendix D**

### **Interview Questions for Participant Family Members**

1. Please tell me about your family's daily routines.
2. How long have you had your braille writer?
3. When is your child exposed to braille during your daily routines?
4. Where do you keep your braille writer?
5. What strategies did your early interventionist coach you on for helping your child develop emergent braille literacy and emergent braille writing skills?
6. What strategies were you able to implement?
7. What strategies were difficult to implement?
8. What emergent reading and writing skills do you feel your child does well in?
9. Can you tell me about times your child chose or chooses to participate in or observe reading and/or writing activities?
10. What is your impression of how your child relates to the braille writer?
11. What is your child doing with the braille writer?
12. What do you notice about your child when you or other people in your family use the braille writer?