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The Process and Progress of Literacy Development in Young
Children with Physical and Speech Disabilities: A Multi-Case Study

Carole L. Isakson

A dissertation submitted in partial fulfillment of the
requirements for the degree of

Doctor of Philosophy

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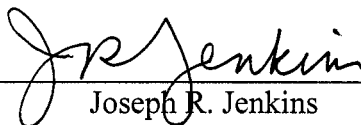
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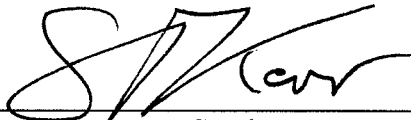
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Abstract

The Process and Progress of Literacy Development in Young
Children with Physical and Speech Disabilities: A Multi-Case Study

Carole L. Isakson

Chair of the Supervisory Committee:
Professor Joseph R. Jenkins
College of Education

While much is known about the course of literacy acquisition in typically developing children, little is known about how children who have physical and speech disabilities move through the stages of literacy development or how best to support them when they run into difficulty. Although educators recognize that children who are learning to use augmentative and alternative communication (AAC) systems have difficulty learning to read, we know very little about the factors that impact literacy development for this population during the early school years.

This dissertation presents the findings of a qualitative research project that examined the literacy development, over three academic years, of three children with physical and speech disabilities who were learning to use AAC systems. Data were collected through classroom observations, examination of school records and classroom artifacts, a parent questionnaire, and interviews with parents and educators. During data collection and analysis, factors that supported or impeded literacy development were grouped into three broad contexts: classroom and

instructional factors, home and family influences, and individual differences or factors within the child.

Although the children were performing at grade level in emergent and beginning literacy skills at the start of the study, by the end of the third year they had fallen well-below grade level. All three children developed phonemic awareness and graphophonemic knowledge of phonemes they were unable to articulate; yet, the three children failed to keep pace with their nondisabled peers in literacy acquisition. Factors within all three contexts impacted their literacy development. The children's families provided them with opportunities for literacy experience and had high expectations for their children's success; yet at times literacy concerns were overshadowed by the children's other needs. At school, the quality of instruction the children received was inconsistent. The children required considerable scaffolding and step-by-step instruction in aspects of language and literacy that are often learned with little effort by typically-developing children. In some cases, classroom instruction failed to address the children's academic and literacy needs. The children's individual characteristics impacted their literacy development both positively and negatively. The implications of the research are discussed.

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DEDICATION

This document is dedicated to the three children who participated in this study. It was a great pleasure to come to know them. May their lives be rich with love and learning.

CHAPTER ONE: INTRODUCTION AND BACKGROUND

Language provides to thought the possibility to range over vast stretches of time and space, liberating it from the immediate. (Piaget, 1983, p.110)

Statement of the Problem

Just as spoken language provides the ability to express ideas about the past, the future, the internal, and the distant, written language provides the power to retain and share those ideas beyond the confines of memory and time. Literacy provides “mastery over the processes by means of which culturally significant information is coded” (DeCastel & Luke, 1988, p. 159). As individuals, reading enables us to build knowledge, acquire information, feed our interests, derive pleasure, and enrich our lives (Jenkins & O’Connor, 2002). For an individual who has significant limitations in oral communication, the power of literacy may be far greater. Literacy can provide previously unknown access to social interactions, recreational and vocational activities, employment, and independent communication (Foley, 1993; Koppenhaver, Evans, & Yoder, 1991). Yet, the majority of individuals who have significant physical and speech disabilities read and write at levels significantly below those of their non-disabled peers (Beukelman, Mirenda, & Sturm, 1998; Koppenhaver & Pierce, 1994; Smith, 2005). According to a 1992 report, “Literacy learning difficulties in persons with severe speech and physical impairments (SSPI) are widespread, varied, profound, and persistent” (Koppenhaver & Yoder, 1992, p.146).

While much is known about the course of reading acquisition in typically developing children (Adams, 1990; Chall, 1983; Ehri, 1998; Juel & Minden-Cupp,

1998; Share & Gur, 1999; Tunmer & Hoover, 1992), we know very little about how children who have severe speech impairments move through the stages of literacy acquisition or how best to support them when they run into difficulty. The purpose of this research project was to increase our understanding of the process and progress of literacy acquisition in young children with physical and speech disabilities and to identify factors that impact their literacy development, either positively or negatively.

Reading and Learning to Read

The simple view of reading (Hoover & Gough, 1990; Juel, 1988) portrays reading as the product of decoding and language comprehension. Clearly, if either of these two components is inadequate, skilled reading will not take place. Each is necessary, but not sufficient for reading success (Tunmer & Hoover, 1992). Adams (1990) presented a model of reading made up of four processors – the orthographic processor, the phonological processor, the meaning processor, and the context processor – working interactively to extract meaning from text. Perfetti's (1985) *verbal efficiency theory* provides a model to explain comprehension difficulties. Verbal efficiency theory, like limited capacity theory (LaBarge & Samuels, 1974), suggests that if the brain is tied up with decoding and other lower-level processes, it does not have the resources available to attend to comprehension.

We have learned a great deal about the process of reading development and where things may go awry from research with typically developing children and children with reading disabilities. Research in recent decades has identified

phonological awareness in early childhood as the best single predictor of subsequent reading success (Wagner et al., 1997). Lexical retrieval and verbal memory are also known to play significant roles in early reading development (Torgesen & Wagner, 1998) and are predictive of reading outcomes. Phonemic awareness – the ability to analyze the sounds of language at the phoneme level – is essential for reading an alphabetic orthography; but sophisticated levels of phonemic awareness are, paradoxically, a consequence of learning to read (Morais, Luz, Jesus, & Bertelson, 1979; Tunmer & Hoover, 1992). In addition, many factors that contribute to reading development – vocabulary, background knowledge, syntactic knowledge – are developed by reading (Stanovich, 1986). Without intervention, a child who encounters difficulty with reading in first and second grade is likely to continue to be a poor reader in fourth grade and beyond (Juel, 1988; Scarborough, 1998).

Stages of Reading Development

Reading acquisition is a developmental process that requires qualitatively different cognitive skills at different stages (Chall, 1983; Spear-Swerling & Sternberg, 1993; Tunmer & Hoover, 1992). Literacy researchers have developed models to conceptualize the processes of reading acquisition and reading disability. These models provide a scaffold for understanding multifaceted internal processes. Even the most complex models reduce and simplify the phenomenon described; however, by giving name to the stages and patterns observed, they provide a vocabulary and context for discussing reading. Ehri (1997) developed a model of reading development that provides four stages that she named *pre-alphabetic*,

partial-alphabetic, full-alphabetic, and consolidated-alphabetic. In the following discussion I use Ehri's model and nomenclature to examine the stages of reading development.

Pre-Alphabetic

In the pre-alphabetic stage, children are aware of print as a vehicle for language, but they do not use letter-sound correspondences to read words. Instead, the focus is on prominent visual cues. Children who are at this stage lack *alphabetic insight*. Alphabetic insight is the recognition that there is information about the phonology of a word embedded in the letters that form the word. In order for a child to move forward in reading development, the child must recognize that text is a code, or cipher, for language (Gough & Hillinger, 1980) and must know some letter-sound correspondences (Lieberman, Shankweiler, & Liberman, 1989). Many children who lack alphabetic insight also demonstrate little or no phonemic awareness (Spear-Swerling & Sternberg, 1993).

Partial-Alphabetic

In the partial-alphabetic stage, readers begin to make connections between letters and sounds in the printed and spoken forms of words (Ehri, 1997; 1998). Children often focus on first and last letters. They may associate sounds with the letter name. At this stage, readers are not able to sound out unfamiliar words; however, they are using some of the letters in the words as phonetic cues. In the partial-alphabetic stage the child has attained alphabetic insight, but may know only a few sound-symbol correspondences. The child may use contextual cues or sight

word knowledge to attempt to compensate for poor decoding skills (Spear-Swerling & Sternberg, 1993).

According to Juel (1998), it is phonemic awareness and the *concept of word* that enable children to move into the partial-alphabetic stage. “One of the reasons I now believe phonemic awareness is so important as a predictor of early reading acquisition is that it functions to help children identify where words exist on a page. Concept of word and phonemic awareness operate together like a radar device to allow the accurate tracking of words” (p. 452).

Full-Alphabetic

As children develop more complete graphophonemic knowledge and phonemic awareness, they move into the full-alphabetic stage where they use all available orthographic information to decode words (Tunmer & Hoover, 1992). In the full-alphabetic stage, readers can segment words into phonemes and can decode unfamiliar words. This is a significant attainment in reading development. According to Share (1999), phonological analysis of unfamiliar words represents the *sine qua non* of reading acquisition. It is the ability to decode unfamiliar words that enables children to learn to read the many thousands of words they encounter in print. Nonetheless, the full-alphabetic stage is characterized by slow, laborious decoding of unfamiliar words. Children whose progress stalls at this stage are termed *non-automatic readers* by Spear-Swerling and Sternberg (1993). They are able to decode words accurately, but their decoding is slow and effortful, using up cognitive resources, which are therefore unavailable for comprehension (Perfetti, 1985).

Consolidated-Alphabetic

It is during the consolidated-alphabetic stage that reading becomes automatic and fluent. Common letter sequences are consolidated in memory; readers recognize familiar spelling patterns, and reading becomes rapid and effortless (Ehri, 1997). Automatic word recognition is achieved as a result of repeated exposure to words through reading practice (Jenkins & O'Connor, 2002). Chall refers to this development of automaticity as “ungluing from print” (1983, p. 18).

Children with Speech Disabilities

At one time, it was believed that reading was contingent upon speech, that is, a child must be able to speak, before learning to read and write. The published autobiographies and essays of adults with severe communication impairments have made it clear that this assumption was incorrect (Brown, 1954; Fried-Oken & Bersani, 2000; Nolan, 1987). Although speech is not prerequisite to literacy, the lack of speech presents significant obstacles to learning to read (Berninger & Gans, 1986; Foley, 1993; Koppenhaver & Yoder, 1992). Even in the absence of oral-motor disability, children who have expressive phonological disorders have a higher incidence of reading disabilities than children with typically-developing speech (Bird, Bishop, & Freeman, 1995; Gathercole & Baddeley, 1990; Larrivee & Catts, 1999).

Articulation plays a role in the development of phonological awareness. There is evidence that individuals who have difficulty developing phonemic awareness may be helped by attending to the kinesthetic sensations of articulation

(Lindamood, Bell, & Lindamood, 1992; Sheffield, 1991). It is, in part, through hearing themselves speak, while simultaneously experiencing the sensations of speech, that children learn to accurately produce the words they hear (Gopnik, Meltzoff, & Kuhl, 1999). By the age of 24 months, children's speech production accounts for half of their daily language experience (Hart & Risley, 1999). Clearly, children who do not have the experience of producing communicative speech have a very different experience learning language and literacy.

Contexts of Literacy Learning

In order to become proficient readers, children with disabilities have to master the same skills as all other readers. To be a skilled reader, an individual must develop phonological awareness, graphophonemic knowledge, decoding skill, automatic word recognition, reading fluency, and language comprehension (Jenkins & O'Connor, 2002). How do individuals with significant speech and motor impairments master these skills in order to learn to read and write?

In 1991, researchers asked that question to 22 adults with severe speech and motor disabilities who had been identified as skilled and fluent readers (Koppenhaver et al., 1991). The researchers asked the study participants to reflect back on their experiences as children learning to read. The study participants responded to multiple-choice and open-ended questions about being read to, reading independently, reading by choice, and reading for school assignments. They were asked about access to books, magazines, comics, and technology used for writing and reading, as well as visits to libraries and bookstores.

The study focused on two contexts: home and school. For the most part, the students grew up in homes where family members regularly read for pleasure. As children, the participants were read to frequently and as they got older read for pleasure independently. Family members were credited with being very important in helping the study participants learn to read. On average, the participants listed 3.8 individuals who contributed to helping them learn to read. About half of the participants in the Koppenhaver et al. (1991) study took part in summer or after-school tutoring programs or received one-on-one help while in school. Despite their success with literacy, the participants' most frequent school memories of reading were about unhappiness or frustration. Memories of home reading experiences were positive. When asked why they had succeeded with literacy when so many individuals with similar disabilities had not, the individuals attributed their success to the high goals and expectations of their parents and to their own characteristics of persistence, determination, and intelligence. The researchers' focus had been on the contexts of home and school. The responses of the interviewees suggested the third dimension: individual characteristics.

School Experiences and the Role of Instruction

Methods of instruction are frequently the focus of literacy research for typically developing children and children who struggle with reading (Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998; Torgesen et al., 1999). Literacy research has demonstrated that a systematic phonics-based approach is an effective instructional strategy with beginning readers (National Reading Panel, 2000).

Instructional practices based on literacy research are correlated with improved student outcomes, but educational research doesn't always find its way into the classroom (Chard & Kameenui, 2000; Cunningham, Perry, Stanovich, & Stanovich, 2004; McCutchen et al., 2002). Classroom culture and literacy tasks can influence young children's developing motivation for reading and writing (Bogner, Raphael, & Pressley, 2002; Nolen, 2001).

There is a small body of published research on the subject of reading instruction for children with speech and motor impairments. A classroom ethnography published in 1995 explored the experiences of five children with cerebral palsy between 12 and 14 years of age in a self-contained special-education classroom (Mike, 1995). All of the students were reading at a second grade level or below. Although the school administrators reported that the class promoted literacy, the researcher found that the children received less than 30 minutes of reading instruction a day. The results of an unpublished doctoral dissertation (Koppenhaver, 1991, cited in Koppenhaver & Yoder, 1993) reported on the reading instruction provided to three boys between 10 and 14 in three separate self-contained classrooms. The students in these classes also received very little instruction. Literacy activities were teacher directed and primarily consisted of assessment activities and feedback as to whether the student's responses were right or wrong.

A report published in *The Reading Teacher* documented an interdisciplinary team effort to incorporate emergent literacy activities in a self-contained special-education classroom with eight children who had physical and cognitive disabilities

(Erickson & Koppenhaver, 1995). The collaborative team included a special educator, a speech pathologist, physical and occupational therapists, and instructional support staff. Literacy activities were incorporated into the daily activities of the children. For example, “In the pool, the [physical] therapist placed letters on the edge of the pool and encouraged the children to reach for a specified letter” (p. 679). The researchers reported that all of the children made progress in their emergent literacy skills. In a more recent study, a single-subject, multiple probe design was used to evaluate a phonemic awareness intervention for three young children with communication disabilities (Millar, Light, & McNaughton, 2004). Two of the three children developed the target skill and were able to generalize the skill to other tasks.

Home and Family Influences

To a large extent, metalinguistic differences that children demonstrate by the time they arrive in kindergarten are the consequence of their experiences with language and literacy in the preschool years (Adams, 1990). The role that books and print play in the home shapes the child’s understanding of the meaning and value of written language (Baker, Scher, & Mackler, 1997; Heath, 1982; Schieffelin & Cochran-Smith, 1984). Exposure to nursery rhymes and children’s literature calls attention to the sounds of language and fosters phonological awareness (Bradley & Bryant, 1985; Maclean, Bryant, & Bradley, 1988). Storybook reading familiarizes children with the top-to-bottom left-to-right orientation of English orthography as well as the purpose and pleasure of books (Bus, van Ijzendoorn, & Pellegrini, 1995;

Cox, Fang, & Otto, 1997). Furthermore, books provide access to information, events, and vocabulary beyond the child's day-to-day experiences (DeBaryshe, 1993; Robbins & Ehri, 1994).

Research that examined the frequency and nature of storybook reading in the lives of young children with disabilities found that children with disabilities are read to less frequently (Light & Kelford-Smith, 1993; Marvin, 1994) and the children play a less active role in reading interactions (Light, Binger, & Kelford-Smith, 1994). For children with speech and motor disabilities, other demands of daily living impact the time available for literacy activities. The parents of children with disabilities spend considerably more time each day with basic care-giving for the child, such as feeding, bathing, dressing, and toileting. Parents often indicate that literacy is a lower priority for young children with disabilities, and parents of young children with disabilities may express lower expectations for the child's future literacy learning (Light & McNaughton, 1993). The researchers cautioned, "Low expectations for development may translate into a neglect of literacy related activities and ultimately into a self fulfilling prophecy of limited achievement" (p. 40).

The Child and Individual Differences

Researchers have explored individual differences among typically developing children and the role those differences play in literacy development (Morris, 1998; Stanovich, 1980; Tunmer, Herriman, & Nesdale, 1988). Researchers have identified correlations between reading difficulties and deficits in phonemic awareness, verbal

short-term memory, and rapid letter naming (Adams, 1990; Torgesen & Wagner, 1998). Stanovich (1980) presented the *interactive compensatory model* to explain individual differences in the development of reading fluency. The interactive compensatory model contends that reading is accomplished by a synthesis of information simultaneously provided from several knowledge sources. If any one of these knowledge sources is deficient, other knowledge sources compensate. Stanovich (1980) found that poor readers rely more on context than do good readers. It is when there are deficits in decoding ability that readers use context to help identify unknown words.

Vandervelden and Siegel (1999) conducted a study of 64 students with cerebral palsy that focused on phonological processing abilities. The students with cerebral palsy were paired with reading-level matched controls – younger students with no known disabilities. The researchers found that the students with cerebral palsy scored significantly lower than reading-level matched controls in all areas of phonological processing. Two studies conducted in Sweden (Dahlgren-Sandberg & Hjelmquist, 1996, 1997) produced findings that appear to contradict those of Vandervelden and Siegel. Dahlgren-Sandberg and Hjelmquist also used matched control groups; however their control groups were matched by gender, chronological age, and mental age. These researchers found that both groups of students scored comparably on assessments of phonological awareness. However the control group scored significantly higher on all reading and writing tests. Neither of these studies found the correspondence between phonological awareness and reading ability that

has been reported for typically developing children. In addition, the two studies appear to contradict one another. Recognizing that these contradictions may be the result of discrepancies in the assessment process, Vandervelden and Siegel (2001) investigated the appropriateness of alternative assessment tasks for individuals with speech and motor disabilities. They found that, in some cases, adaptations to tasks that were made to accommodate the students' inability to respond orally altered the requirements of the tasks. This is a population for whom assessment can be challenging. Vandervelden and Siegel (1999) wrote, "The results of a relatively small body of research that has addressed phonological processing in students with congenital motor speech impairment is inconclusive" (p. 192).

Children with congenital physical and speech disabilities demonstrate a plethora of individual differences. At this point, it isn't clear if there is commonality in their differences in reading related skills and deficits (Vandervelden & Siegel, 1999). The individual characteristics cited by the participants in the Koppenhaver, Evans, and Yoder (1991) study – persistence, determination, motivation – may be appropriate areas of inquiry when working with this population for two reasons. One is the difficulty of accurately assessing phonological processing and lexical retrieval skills. The second reason is that young children with significant physical disabilities are at great risk for developing passivity and learned helplessness (Abramson, Seligman, & Teasdale, 1978; Brinker & Lewis, 1982), which impact all areas of learning.

Development of Self-Efficacy

Contingency learning is the process of becoming aware of the relationship between actions and their consequences and actively exploring and controlling those relationships (Brinker & Lewis, 1982; Sullivan & Lewis, 1993). The infant with motor impairments makes less frequent contact with objects in the environment and has fewer opportunities for contingency learning (Brinker & Lewis, 1982; Sullivan & Lewis, 1993). Without the experience of contingency learning, the child's development of agency and self-efficacy are at risk.

In developing a conception of personal agency, infants must gain self-recognition and learn that they can make things happen. Infants' exploratory experiences in which they see themselves produce effects by their actions provide the initial basis for moving beyond understanding action causation to developing a sense of personal agency.... The initial enactive experiences that contribute to development of a sense of personal agency are tied to infants' ability to control the sensory stimulation from manipulable objects and the attentive behavior of those around them. (Bandura, 1997, p.164)

Psychologists use the term *learned helplessness* to describe the condition of passivity, withdrawal, and depression experienced by individuals who have been exposed to prolonged periods in an uncontrollable environment (Abramson et al., 1978). Patterns of apathetic behavior, absence of curiosity, and passivity have been documented in typically developing children whose mobility has been restrained for medical reasons as well as in children with neuromotor disorders (R. D. Becker, 1975; Yarrow & Pederson, 1976). The development of learned helplessness creates

an escalating spiral of restricted experience that impacts all areas of the child's development. The development of self-efficacy, motivation, and determination are undoubtedly critical aspects in literacy learning for this population. Although I am categorizing these factors as within the child, they can be supported or undermined in the contexts of home and school.

The Role of Technology

Today, children with speech and motor impairments have opportunities for a wider range of experiences than did the generations of children with disabilities who came before them. Assistive technology is available that can provide a level of independence in mobility, reading, writing, and communication that were unknown to previous generations. An augmentative and alternative communication (AAC) system can provide a supplemental method of communication for individuals whose speech and gestures are inadequate to meet their communication needs (Mirenda, 1999).

The use of technology by infants and toddlers can provide access to contingency learning experiences and can play a role in preventing the development of learned helplessness (Sullivan & Lewis, 2000). Researchers have reported positive changes in attention, initiation, persistence, and affect when young children with disabilities were provided with access to power mobility (Butler, 1986; Deitz, Swinth, & White, 2002; Kermoian, 1998). Technology is widely used in elementary school classrooms today. Software is available that can provide support to beginning readers by highlighting text and providing synthesized speech output for selected

words, phrases, or entire documents (Wise, Ring, & Olson, 2000). The availability of books on compact disc provides access to printed material for students who cannot handle hardcopy text. Online encyclopedias, dictionaries, and the World Wide Web provide resources to students with limited access to books and documents (Burgstahler & Comden, 2002).

Students with motor impairments can use computers equipped with appropriate assistive technology for composing text (Kelford-Smith, Thurston, Light, Parnes, & O'Keefe, 1989). Researchers have reported that access to computer-generated written expression supports literacy development in students with speech and motor disabilities (Steelman, Pierce, & Koppenhaver, 1993). The use of speech-output augmentative communication devices provides children with expanded means and experiences of expressive language. Case study evidence suggests that learning to use an AAC system supports language and literacy learning, just as learning to read and spell supports communication (Blischak, 1995; Erickson, Koppenhaver, Yoder, & Nance, 1997).

Although technology provides children who have significant physical and speech disabilities with many previously unknown opportunities, technology tools alone are insufficient to support the literacy development of these children. Many factors, both intrinsic and extrinsic, play a role in literacy acquisition for individuals who have significant disabilities.

Research Questions

The purpose of this study was to expand our understanding of the process and progress of literacy development in young children with physical and speech disabilities during their early school years. The study addressed the following questions: How do factors within the school, within the home, and within the child support or impede progress toward proficient literacy for a child with significant physical and speech disabilities? How does the child make progress through the stages of reading development? Where along the path does the child encounter problems? Is there a qualitative difference in the process or progress of literacy acquisition for a child with a severe communication impairment? How is technology used in the home and school contexts to support reading and writing? How does the use of an augmentative communication system impact literacy acquisition and how does literacy development impact communication for the child?

Conceptual Framework

I began this inquiry with the assumption that a child with physical and speech disabilities passes through stages of literacy acquisition comparable to those of typically developing children, that is, they follow fundamentally the same route on the path to literacy as typically developing children. Until we develop a body of research on literacy acquisition in children with speech and motor disabilities, theories of instruction for this population will be grounded in what we know from research on how typically developing children learn to read. Nonetheless, children with significant disabilities face exceptional circumstances and challenges as they

learn to read. As a result of these challenges, assistive technology and interdisciplinary collaboration play significant roles in their education. Children with speech and motor disabilities require assistive technology for expressive communication as well as access to appropriate technology to support independent reading and writing. The expertise of family members and professionals from a variety of disciplines is required to provide optimal support in the education of children with significant disabilities. Finally, I undertook this inquiry with the perspective that the factors that impact the progress of literacy acquisition in young children can be conceptualized as being within three broad contexts: classroom and instructional factors, home and family influences, and individual differences or factors within the child.

CHAPTER TWO: METHODOLOGY AND METHOD

Everything has the potential to be data, but nothing becomes data without the intervention of a researcher who takes note – and often makes note – of some things to the exclusion of others. (Wolcott, 1994, p. 3-4)

A Qualitative Multi-Case Study

Special education research is the study of exceptional populations. While statistical methods of research are well-suited to document the impact of interventions in large studies, other tools may be required to examine the experiences of small or heterogeneous populations. Single-subject, experimental methods of research are appropriate when the target of inquiry is the effect of an intervention on a specific, measurable behavior (Kazdin, 1982). However, if the population of interest is very small and heterogeneous and the topic of inquiry is broad and complex, qualitative research methods are the preferred choice.

While the efficacy of quantitative inquiry is obtained by limiting the variables of interest, the success of researchers in doing so necessarily simplifies their object of inquiry. Though understanding complexity is not exclusive to qualitative inquiry, qualitative methods are notably suited for grasping the complexity of the phenomena we investigate. (Peshkin, 1988, p.416)

Ferguson and his colleagues suggest that qualitative, interpretive research is particularly well suited for the study of disability issues (Ferguson, Ferguson, & Taylor, 1992).

I used qualitative case-study methods to explore the literacy development and literacy difficulties of three young children with significant motor-speech

impairments. “Case studies are the preferred strategy when ‘how’ or ‘why’ questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life contexts” (Yin, 1994, p.1). The case study provides an opportunity to explore multiple dimensions of a complex social situation (Stake, 1998). A close examination of a single case can provide ideas and demonstrate promising strategies (Shavelson & Towne, 2002).

The qualitative research paradigm reflects a world view that recognizes the interconnected nature of the observer and the observed, of the construction of knowledge and the experience of the known world. The qualitative researcher is less concerned with uncovering objective facts and more concerned with constructing understanding of complex phenomena. A key assumption of qualitative research is that reality is constructed by individuals interacting within their social environments (Merriam, 1998). As Eisner explained, “Human knowledge is a constructed form of experience and therefore a reflection of mind as well as nature: Knowledge is made, not simply discovered” (Eisner, 1991, p. 7).

The Researcher as Instrument

In qualitative inquiry, the researcher is the primary instrument of data collection and analysis (Lincoln & Guba, 1985). Whereas a researcher using statistical methods would strive to achieve identical findings with an alternative set of researchers, qualitative researchers expect that each researcher will uncover somewhat different aspects of the phenomena explored.

Harry Wolcott (1994) wrote, “In fieldwork I am guided by the maxim that you don’t have to be neutral to be objective” (p. 366). Patton (2002) described his research stance as “empathetic neutrality.” Lincoln (2001) wrote that objectivity is a construct devised within a particular epistemological framework. I do not pretend to be neutral about the importance of literacy learning in the lives of children with disabilities. I come to this inquiry with the view that I can best make a contribution to the body of knowledge on literacy development in children with communication disabilities by leaving my preconceptions at the door while working to develop an understanding of the complexity of the children’s experiences as they learn to read and write.

Research Overview

This inquiry began as a small study that explored the classroom experiences of three children over a period of a few months. I presented the findings from that preliminary study to colleagues on two occasions: first, to professors and fellow doctoral students in a research methods class and later at a College of Education Research and Inquiry Seminar. Feedback and reflection after those presentations led me to extend the time frame of the inquiry and to expand my focus to include factors within the home and within the child. Data collection for this study took place over three academic years.

Although this is a study that explored literacy development, I did not administer any tests of the children’s reading or pre-reading skills. All assessments regarding the children’s literacy progress are based on observations, school records,

and teachers' reports. I did not want to formally assess the children for three reasons. First, there are no established literacy assessment instruments for this population (Smith, 2005). Assessment instruments designed for typically developing children must be adapted for the children and adaptations often confound the results (Vandervelden & Siegel, 2001). Developing and administering an assessment instrument was beyond the scope of this study. Second, I did not want to alter the children's ongoing instruction or assessment; I wanted to learn what was already taking place in the classroom. Third, this study required the continued cooperation, consent, and generosity of parents, students, teachers, principals, speech pathologists, and classroom aides over three academic years. Each year new informants had to be recruited as the children changed classes and schools. I felt it was in the best interest of the continuation of the study to limit the range and intrusiveness of my requests.

Participants and Setting

The participants in this study were three young children who had neuromotor impairments that impacted their speech and their ability to engage in fine and gross motor activities. When I approached a special-education administrator in a large urban school district near my home about potential participants for this study, I learned that there were three young children in the district with speech and motor disabilities who were learning to use AAC systems. The three children were the only pre-school or primary-grade students in the district who were using high-tech AAC devices. At the time, all three children were attending the same elementary school. After receiving a letter of cooperation from the school principal, I contacted the

children’s classroom teachers. The teachers agreed to participate and to send the recruitment letters home to the children’s parents. The children’s parents provided consent for the children to participate in the study. Over the three academic years of the study, the children attended classes at two additional schools. The principals of those schools provided me with letters of cooperation. The classroom teachers and other interview subjects who participated provided written consent.

Table 1. Children’s Characteristics in Year One of the Study

	Haley	Angela	Alexa
Age	6 years 9 months	5 years 9 months	5 years 9 months
Grade in school	Kindergarten	Kindergarten	Pre-School
Known disabilities	Fine & gross motor impairments Dysarthria Visual tracking difficulties	Fine & gross motor impairments Dysarthria	Fine & gross motor impairments Dysarthria
Mobility method	Ambulatory	Walker	Wheelchair

The children were Alexa, a 5-year-old preschooler, Angela, a 5-year-old kindergartener, and Haley, a 6-year-old kindergartener. (All names are pseudonyms.) Angela and Alexa were twins. All three children were able to produce some speech sounds – primarily vowel sounds – that could sometimes be understood by familiar communication partners; nonetheless, the children’s speech was inadequate to meet their communication needs. The children had fine motor impairments and none of the three could form numbers or letters with a crayon or pencil. All three were able to point and select a key on a keyboard. Haley was able to walk independently; Angela used a walker, and Alexa used a wheelchair for mobility. Although Angela

and Alexa were twins, a decision had been made by Alexa's Individualized Education Program (IEP) team that she would benefit from spending an additional year in pre-school, rather than moving on to kindergarten with her sister. Thus Angela was in kindergarten and Alexa in pre-school; see Table 1.

The adult informants in this study were the mothers of the children and the educators who were providing language and literacy instruction to the children during the three years of the study. See Table 2. With one exception, I interviewed the educators in their classrooms or offices in public school buildings. I interviewed one teacher at a cafe, at the teacher's request.

Table 2. Educators Interviewed

Mr. Zima	Speech Language Pathologist (SLP) and AAC Specialist who worked with all three children all three years
Ms. Grant	Angela and Haley's classroom teacher at Valley View Elementary School in the first two years of the study
Ms. Reynolds	Alexa's pre-school teacher at Valley View Elementary School in the first year of the study
Ms. Anderson	Alexa's kindergarten teacher at Laurel Lake Elementary School in the second year of the study
Ms. Wood	Distar instructor who worked with Alexa at Laurel Lake Elementary School in the second year of the study
Ms. Parker	Angela and Alexa's classroom teacher at Birch Bay Elementary School in the third year of the study
Ms. Matthews	Haley's classroom teacher at Valley View Elementary School in the 3rd year of the study

The parent interviews took place in the children's homes. My observations of the children took place in the three public elementary schools that the children attended during the course of the study.

Data Collection

Harry Wolcott proposed that the “the full range of data-gathering techniques employed in qualitative study can be subsumed under three categories of activity ... *watching, asking, and ... reviewing*” (Wolcott, 1992, p.19). In this study, I employed all three.

Table 3. Matrix of Research Questions and Data Sources

Research Questions	Classroom Observations	Interviews with Teachers	Questionnaire	Parent Interview	Records & Artifacts
How do factors within the school support or impede progress toward proficient literacy?	✓	✓		✓	✓
How do factors within the home support or impede progress toward proficient literacy?		✓	✓	✓	
How do factors within the child support or impede progress toward proficient literacy?	✓	✓	✓	✓	✓
How does the child make progress through the stages? Where does the child encounter problems?	✓	✓		✓	✓
How is technology used to support reading and writing? How does the child’s AAC use support literacy development?	✓	✓	✓	✓	✓

I collected data from classroom observations, parent and teacher interviews, parent questionnaires, school records, and classroom artifacts. See Table 3 for a matrix of the relationships between research questions and data sources; see Table 4

for the relationship between data sources and the three contexts of literacy development.

Table 4. Data Sources for the Three Literacy Contexts

Data Sources	Individual Child	Home & Family	School
Classroom observations (in 3 grades)	✓		✓
Interviews with classroom teachers and other educators	✓	✓	✓
Parent questionnaires	✓	✓	
Open-ended interviews with parents	✓	✓	✓
School records & classroom artifacts	✓		✓

Researcher Participation

Spradley (1980) outlined five possible degrees of involvement in participant observation: nonparticipation, passive, moderate, active, and complete. My initial plan for classroom involvement was to be a passive participant – the classic fly-on-the-wall. In practice, my participation was not always passive. At times, teachers drew me into classroom discussions or requested my involvement in classroom activities. Children sometimes asked for my help closing an overfull book-bag or zipping up a jacket. Nonetheless, my highest level of participation occurred in the third year of the study at my own initiation.

In the third year of the study, the school district where my study was taking place initiated a new program intended to better meet the academic needs of young children who used AAC. Two of the students in my study were enrolled in that new program. At a summer workshop on augmentative communication, I met the teacher

who was hired to teach their class. I told her about my study and she agreed to participate and to allow me to observe in her classroom. She also invited me to spend additional time as a volunteer in her classroom. After discussing the matter with the chairman of my dissertation committee, I decided to accept her offer and volunteer in the class. I felt that spending additional time in the classroom would broaden my understanding of the classroom experiences of young children with motor-speech disabilities.

I volunteered for one to two hours, once or twice a week for most of the school year. As a classroom volunteer, I helped the teacher in whatever way she requested. I loaded software on the children's computers, helped the teacher with classroom activities, read to the children, and accompanied the children to inclusion activities. The experience provided me with a deeper knowledge of the children and a broader understanding of the dynamics of the classroom.

When I was a volunteer, I did not take notes while I was in the classroom or collect any samples of the children's work. However, at the end of the day I often made journal entries about my experiences in the classroom. I saw myself as having two distinct roles: one as researcher, the other as volunteer. From September until January, I was exclusively a classroom volunteer – although I sometimes felt my researcher-self lurking in the background, peering over my volunteer shoulder. In mid-January I officially put on my researcher's hat and began making appointments with the teacher to observe in her classroom. On days when I was a researcher, I didn't assist the children or read with them; I observed and took notes. This

arrangement was sometimes awkward. There were times when a child was waiting for help from an adult and I didn't provide that help, but instead sat and took notes. Perhaps I created an unnecessarily strict division between my two roles. It was an artificial dichotomy that a more experienced researcher might have handled more gracefully.

Observations

My classroom observations were step-wise, rather than longitudinal (Wolcott, 1999) in that my visits were repeated after an interval, rather than continuous over time. I observed each child at school several times over a two month period each year for three consecutive years. Appendix A provides a list of all observations and interviews along with the corresponding document numbers of the transcripts of those interactions.

Table 5. Areas of Focus

Primary Areas of Focus in the Three Contexts
<p><i>Within the school</i></p> <ul style="list-style-type: none"> • Type of instruction; whether instruction was research-based • Classroom practices that promote literacy motivation • Inclusion and participation of the child; adaptations to instruction and technology use <p><i>Within the home</i></p> <ul style="list-style-type: none"> • Quality and quantity of exposure to print, children's literature, and storybook reading • Parental goals and expectations for literacy achievement by the child • Access to tools and materials for reading and writing by the child <p><i>Within the child</i></p> <ul style="list-style-type: none"> • Evidence of self-efficacy, persistence, determination • Literacy capabilities: alphabetic insight, phonological and orthographic awareness • Reading motivation, response to instruction

During classroom visits, I observed the types of literacy activities that were taking place; I noted the level of participation of the child. I recorded the child's level of engagement and demeanor as well as the child's apparent level of success with the lessons. I watched for classroom practices that interfered with learning as well as those practices that were supportive of the child's literacy development. I took handwritten field-notes during observations. See Table 5 for areas of focus in the three contexts. I worked to maintain a balance between remaining focused on the issues relevant to my study and remaining open to unexpected phenomena.

Interviews

I conducted 14 interviews with 9 informants over 3 years; 12 interviews were with educators, 2 were with parents. I spoke with two or three adults about each child each year. I interviewed educators more than once if they worked with more than one child or worked with a child for more than one year. In some interviews, more than one child was discussed. I interviewed each mother once, in the third year of the study. The interviews were semi-structured and open-ended (H.S. Becker & Geer, 1969; Hammersley & Atkinson, 1995; Spradley, 1979). See Appendix B for the guiding questions for the educator interviews and Appendix C for those for the parent interviews. All interviews were audio-taped and transcribed verbatim. Interviewees were provided with a copy of the interview transcript and the opportunity to make changes and corrections.

Documents and Artifacts

During classroom visits, I examined, and in some cases received copies of, the children's written schoolwork. In the second year of my study I examined the children's school records. I made handwritten notes of information from the records and artifacts and transcribed those notes to create electronic data files. In order to learn about the children's home literacy environments, I developed a questionnaire for parents in which I inquired about the child's previous and current home literacy experiences. The questionnaire was based, in part, on the research of Koppenhaver et al. (1991) and Light and Kelford-Smith (Light & Kelford-Smith, 1993). Although the questionnaire was not used for statistical purposes, it was designed to reduce response errors and support respondent trust (Dillman, 2000). See Appendix D for a copy of the questionnaire.

Data Analysis

Simply stated, the goal of all research analysis is to look to the data collected for answers to the research questions; that was the intent of this analysis. In qualitative research, the researcher is said to be the instrument of data analysis as well as data collection (Lincoln & Guba, 1985). Huberman and Miles (1994) indicated that design decisions made early on and choices made during data collection are aspects of analysis as well. According to Merriam (1998), "The right way to analyze data in a qualitative study is to do it simultaneously with data collection" (p. 162). This is fortunate, because analysis and comparison while in the field come naturally to the engaged researcher. Although data analysis was ongoing

throughout the life cycle of the project, it took different forms at different stages of the project. Early on, analysis using constant comparative methods (Glaser & Strauss, 1967; Strauss & Corbin, 1998) took the form of journaling, writing memos, asking questions, and developing ideas. When data collection was complete, I began a more structured approach to both within-case and cross-case analysis.

Codes and Categories

I used Atlas.ti (Muhr, 2000) for data management and coding. I converted all transcripts of interviews and observation notes into electronic text documents and entered them as primary documents in Atlas.ti; see Appendix A. I began the coding process by going through each document, line by line, creating units of data and assigning a code to each unit (Merriam, 1998; Spradley, 1979; Vaughn, Schumm, & Sinagub, 1996). A unit is “the smallest piece of information about something that can stand by itself – that is, it must be interpretable in the absence of any additional information other than a broad understanding of the contexts in which the inquiry is carried out” (Lincoln & Guba, 1985, p. 345). My approach to coding followed the open coding approach outlined by Strauss and Corbin (1998). I created codes that were descriptive, identified the main theme of the unit, and were meaningful in light of the research questions. If an existing code was appropriate for a unit of text, I used it; if no existing code was appropriate, I created a new one. I assigned more than one code to units as appropriate.

After each of the first few documents was coded, I revisited the previously coded material and checked whether any newly created codes should be

incorporated. After I coded the documents from the first year of my study, I went through the code list refining and consolidating it. I noted which codes were used most frequently and which were seldom used. I looked for overlap and repetition. Some codes were merged into other codes. Initially, I had been coding the documents chronologically, but I began choosing documents to code that might be likely to present new activities or concepts and therefore new codes. The procedure was recursive and the codes continued to be refined throughout the many iterations of the process. As the code list began to stabilize, I reviewed the codes based on the research questions and study design and grouped them into code families or categories. “Devising categories is largely an intuitive process, but it is also systematic and informed by the study’s purpose, the investigators orientation and knowledge, and the meanings made explicit by the participants themselves” (Merriam, 1998, p.179). Eventually seven code families or categories emerged: characteristics of the child; child’s literacy progress; classroom literacy activities; collaboration and conflict; home and family; social interactions and peer relationships; and technology.

Because many of the interviews and observations concerned more than one of the children, I created a code for each child. Then, as I examined the data, I was able to use the child-codes to sort and organize the data. For example, using Atlas.ti, I was able to retrieve and examine all data that were assigned both the code *Angela* and the code family *child’s literacy progress*.

Code and Retrieve

Researchers have described two primary roles that codes and code families can play in qualitative data analysis. In some studies the codes or categories inform the findings – the codes themselves provide answers to research questions (Merriam, 1998; Richards & Richards, 1994). For example, in a study of high-school attrition, codes may be used to identify responses provided by participants as to why they dropped out of school. Therefore, codes such as *transportation problems* or *conflict with teachers* may provide insight into the findings. The codes or categories become data for analysis. In other studies, the codes serve an organizational purpose – a way to efficiently file, sort, and retrieve content – and it is the content thus retrieved, rather than the codes or categories that are the subject of analysis. Richards and Richards (1994) refer to this second approach as the *code and retrieve* approach; it is the approach I used. The code families provided a structure to organize the data for retrieval and analysis. “The viewing of segments from many documents on one topic or selected topics always offers a new way of seeing data” (Richards and Richards, 1994, p. 447) and supports the development of new insights.

Within-Case and Cross-Case Analysis

Qualitative research reports are made up of three components: description, analysis, and interpretation – with the proportion of the three components varying across studies (Wolcott, 1994). I found that my approach to analysis followed a parallel trajectory, with each of the three components playing a prominent role during successive stages of the cycle of analysis. I began the process of making sense

of the reams of data I had collected by using co-occurrences of codes to retrieve content for each child, category by category, year-by-year. The juxtaposition of content from different sources, informants, and time periods provided new perspectives on the data. Yet I also often reread sections of the transcripts to review the content in its original context. I wove a portrait of each child from the content of the data in the words of the informants and of my own field notes. Following Wolcott's (2001) advice to begin with description, I created "thick descriptions" (Geertz, 1973) of the three children.

The creation of the descriptive portraits of the children took me into a realm of data analysis that was described by a university professor as "wallowing in the data" (Portin, 2002). I read and re-read, sorted and arranged, reflected, wrote with keyboard and pen, re-read and wrote again – I wallowed. I used the three large, ungainly portraits thus created as the subject of further analysis; thereby moving from the primarily descriptive to the primarily analytic stage. Abbreviated versions of these portraits appear in chapters 4, 5, and 6.

I began the within-case analysis looking at each child across the three contexts and over the three years of the study. I created lists, tables, and matrices to aid the exploration. I wrote to learn, filling notebooks with questions and reflections. Laurel Richardson's explanation of her process resonated with me.

I consider writing as a method of inquiry, a way of finding out about yourself and your topic. Although we usually think about writing as a mode of 'telling' about the social world, writing is not just a mopping-up activity at the end of a research project. Writing is also

a way of 'knowing' – a method of discovery and analysis.

(Richardson, 1994, p. 516)

I compared data for each child across sources and informants, classrooms, and years. I then began moving toward cross-case comparisons: three children, three contexts, three years. I focused on each context in turn – school, home, and intrinsic factors. I used constant comparative analysis within the framework of the research questions (Miles & Huberman, 1994; Strauss & Corbin, 1998) to explore the process and progress of the children's literacy development and to look at factors in the school, home, and child that impacted that process and progress. The primary tools of this inquiry at all stages were reading and writing; I read to learn and I wrote to learn.

Validity and Rigor

In quantitative, experimental research, standards of validity, reliability, objectivity, and generalizability are well defined (Gersten, Fuchs, Coyne, Greenwood, & Innocenti, 2005; Porter, 1997). In qualitative inquiry, questions of rigor are frequently discussed (Altheide & Johnson, 1994; Anfara, Brown, & Mangione, 2002; Caelli, Ray, & Mill, 2003; Lincoln, 2001; Wolcott, 1994), but standards are less well established.

Qualitative researchers have cautioned against superimposing the standards and techniques of quantitative inquiry onto the landscape of qualitative research (Ferguson et al., 1992; Wolcott, 1994). In an attempt to establish the objectivity of the coding process, some qualitative researchers employ a second coder – a technique borrowed from the single-subject experimental research paradigm.

Although this approach may be appropriate in qualitative studies where the codes and categories generate findings, as in the study of high school attrition discussed above, it is a poor fit in studies in which the codes primarily serve as tools to retrieve content for analysis.

Qualitative researchers have suggested a variety of methods for establishing the credibility and quality of interpretive research. Merriam (1998) proposed three techniques that qualitative researchers can use to establish that findings are dependable: (a) make explicit the investigator's position and assumptions, (b) use triangulation in data collection and analysis, and (c) leave an audit trail for the reader to follow (pp. 206-207). Eisenhart and Howe (1992) suggested several standards of validity for qualitative research including "ensuring a fit between research questions, data collection procedures, and analytic techniques" (p. 657). Brantlinger and her colleagues (2005) provided a list of 11 "credibility measures" for qualitative research that includes researcher reflexivity, member checks, collaborative work, peer debriefing, prolonged field engagement, and thick, detailed description, as described in the next section.

Lincoln (2001) argued that the overarching standards of rigor are uniform across research methods. She cited Cronbach and Suppes that "disciplined inquiry" can be defined as "inquiry which demonstrates both the methods by which the raw data were collected and the processes by which they were compressed and rearranged so as to be credible" (cited in Lincoln, 2001, p. 25). Lincoln concluded, "Thus, inquiry which is systematic and rigorous will display both the methodological

decisions which were made, and the processes used to construct the data into findings” (p. 25). Anfara, Brown, and Mangione (2002) agree that the public disclosure of processes and methods is the key to establishing credibility in qualitative inquiry: “We call for qualitative research to be written with enough clarity and detail so that someone else is able to judge the quality of the study and accept or refute the findings” (p. 33). Clarity and detail in qualitative research is often termed *transparency*.

Credibility Measures

I have borrowed techniques from several qualitative researchers for establishing quality and credibility in the design and implementation of this study. In my design, I worked to establish a good fit between research questions and data collection techniques and to make the relationships explicit (Eisenhart & Howe, 1992). See Table 3.

Transparency and detailed description. My goal has been to provide sufficient information about the children’s experiences and about the path I took through research design, data collection, and analysis so that the reader will be able to make an informed judgment as to the value and usefulness of this study.

Triangulation. I used methods of data triangulation by collecting data from multiple sources, using varied methods – and using data from each source to clarify and corroborate data from other sources (Hammersley & Atkinson, 1995; Stake, 1995). See Table 4.

Debriefing by peers. Peer debriefing involves discussing research decisions, experiences, and findings with colleagues and peers (Brantlinger et al., 2005; Lincoln & Guba, 1985). I presented the preliminary findings from the first year of the study to university colleagues in two settings, which led me to expand the focus and the time frame of the inquiry. After I completed the three-year study, I again presented my findings to colleagues: first, in a poster session at a conference on technology and disability (Isakson, 2005) and later in a seminar for professionals who work with individuals who use AAC. The ensuing discussions helped strengthen and clarify my analysis. In addition, I met regularly with my committee chair throughout the research process to discuss the progress of the study; he provided helpful feedback and guidance.

Member checks. I completed two levels of member checks as outlined by Brantlinger et al. (2005): (1) Before coding or analysis, I provided copies of the transcripts to interviewees for them to confirm the accuracy and make changes; (2) After analysis, I discussed my findings with one of the informants in this study, a speech-language pathologist to whom I've assigned the pseudonym Mr. Zima. Mr. Zima was unique among the informants in that he was the only one who worked with all three children all three years of the study. Mr. Zima attended the seminar in which I presented my findings to professionals who work with AAC. After the seminar, he agreed to provide me with feedback and to discuss my findings and interpretation.

Prolonged field engagement. By following the children and their progress over three academic years and interviewing educators over that time frame I was able to get beyond first impressions and develop a richer understanding of their experiences.

Researcher reflexivity. This term refers to the researcher's self-revelation and self-accounting; "Good ethnographies show the hand of the ethnographer" (Altheide & Johnson, 1994, p.493). The reader will judge whether my hand has been adequately shown.

Limitations

This study has limitations. It involved only three children and I observed the children in their school setting over two or three months each year. I spoke with only two or three informants about each child each year. I was the only researcher who collected data and conducted the analysis. Any bias or narrowness of vision on my part will be reflected in the findings. It is possible that different factors would have been apparent if other researchers had participated or if I had observed over a longer period of time each year.

In addition, the children in this study may not be typical of children with physical and speech disabilities. Although all three had severe communication impairments, they had adequate fine motor control to make keyboard selections. Angela and Haley were also more independent in their mobility than many potential AAC users. Angela, Alexa, and Haley had access to state-of-the-art augmentative communication devices from the time they were in pre-school, which is a higher level of technology support than many young children with similar disabilities

receive. As a result, the children's literacy experiences may not be typical of children with speech and motor disabilities. If other children had been the subjects of this inquiry, different factors may have come to the fore and the findings may have been different.

CHAPTER THREE: FINDINGS INTRODUCTION AND OVERVIEW

When I first met the three children in this study they were all special-education students at Valley View School, a public elementary school in a northwestern city. This chapter introduces communication and technology issues that were common to the three children at the start of study and includes a description of the augmentative communication device that the children were learning to use. This chapter also provides an overview of the findings of the study found in the remaining chapters.

The Children's Speech

The three children who participated in this study all had significant motor-speech impairments; yet, all three used their voices for communication and often could be understood when the context was known. For example, in the first year of the study, Ms. Reynolds, Alexa's preschool teacher, asked the children to identify a variety of shapes. When she pointed to a three sided polygon, Alexa was the first to answer. She responded with a three-syllable utterance that sounded something like "I-ang-oo." I understood the utterance to be "triangle" and apparently Ms. Reynolds did as well; "That's right Alexa!" said Ms. Reynolds, "It's a triangle." With the context of the triangle that lay before us, both Ms. Reynolds and I were able to understand Alexa's speech. Nonetheless, it is unlikely that either of us would have understood this utterance were we not expecting the word *triangle*. Often, the children were not understood or were misunderstood, even when the context was known. In the third year of my study, Haley told Mr. Zima, a speech pathologist,

why she liked the story *Mouse Tales*.¹ In order to confirm that he had understood her correctly, Mr. Zima repeated what he understood Haley to have said, “It’s funny and real.” Haley shook her head and spoke the words again. Mr. Zima confirmed that funny was correct, but struggled to understand the last word. Finally he tried, “Funny and weird?” Haley grinned and nodded her head. “Funny and weird,” said Mr. Zima again, looking just as pleased as Haley (P37, 115-117).

The Pathfinder

In order to be able to communicate reliably with both familiar and unfamiliar communication partners, Angela, Alexa, and Haley were learning to use high-tech, electronic, augmentative communication devices. In the year prior to the start of this study, the three children had each received a Pathfinder,² which was a state-of-the-art communication device costing several thousand dollars. The Pathfinder produced synthesized speech output and displayed the text of each message as it was spoken. The Pathfinder could be operated in either a spelling-based mode or in an icon-based mode. The icon-based mode used a system known as *semantic compaction*,³ in which sequences of icons were used to create words and phrases. Thousands of words or phrases could be produced, each requiring only two or three keystrokes. Some icon sequences were easy to remember. All color related words began with the *rainbow* icon; to produce the word *red*, the child would select *rainbow* followed by *apple*. Food related words all began with the *apple* icon. However, many icon sequences were not intuitive and some sequences that would be intuitive to adults involved grammatical concepts unknown to young children. For example, the word

hungry was produced by *apple* plus *adjective* and the word *eat* by *apple* plus *verb*.

Although the Pathfinder was primarily a tool for communication that provided spoken output, it could also be used for written output. The Pathfinder could be connected to a computer and used in place of a keyboard for word processing or email. Text that was produced on the Pathfinder could also be sent to a printer to provide hard copy output.

Mr. Zima was the educator who was charged with the task of teaching the children to use the devices. The first year of my study was the first year of his employment with the school district. The previous June, he had completed a master's program in speech and language pathology. His role was to provide language and communication services to children throughout the district who used high-tech, augmentative communication devices. Mr. Zima was unique among the educators in this study in that he was the only one who worked with all three children all three years of the study.

Overview of the Findings

The presentation of the findings of this study begins with a portrait of each of the children. The portraits in chapters 4, 5, and 6 introduce the children individually and present their literacy experiences, focusing primarily on the school observations and the information provided by the adult interviewees. However, because two of the children were sisters and the children were sometimes in the same classes, their stories intersect and overlap. As a result, each child appears at times in the portraits of the other children; information about one child may emerge during the course of

another child's story. In addition, when the children shared an environment, the bulk of the description of that environment appears the first time the environment is presented. For example, Haley and Angela were both in Ms. Grant's kindergarten class in the first year of the study. Because Angela's portrait is presented first, the greater part of the description of the classroom appears in her story.

The portraits in chapters 4, 5, and 6 are largely descriptive. Chapters 7 through 11 focus on specific aspects or contexts of the children's literacy experiences; these chapters expand on the data presented in the portraits and provide within-case and cross-case analyses. Each chapter addresses one of the five research questions listed in Table 3. Chapter 7 explores the children's literacy development from the perspective of the stages and processes of learning to read. Chapters 8, 9, and 10 examine the factors that support and impede literacy development for the three children in each context: within the home, within the school, and within the child. Chapter 11 examines the role that technology played in the children's literacy development. The final chapter presents the implications and conclusions of the study.

CHAPTER FOUR: PORTRAIT OF ANGELA

Year One: Ms. Grant's Kindergarten Class

I first met Angela in March of her kindergarten year. She and Haley were both in Ms. Grant's combined kindergarten and first-grade class at Valley View Elementary School. It was a special education class with seven students: five kindergarteners and two first-graders. All of the children had speech and/or language impairments; Haley and Angela were the only children in the class who had physical impairments as well. They were also the only two who were learning to use augmentative and alternative communication (AAC) devices. Angela had a walker that she used to move through the hallways of the school, but usually did not use for short distances within the classroom.

Angela's kindergarten classroom was large, attractive, and filled with books, art supplies, puzzles, and games. It was a literacy-rich environment with posters, signs, and word lists on the walls. A colorful calendar was on display and the names of the days of the week were posted on the wall. There was a list of classroom jobs posted, with the name of the child currently holding the job in a slot next to each job title.

On my first visit to Angela's classroom, I arrived before school started and Ms. Grant and I spoke briefly before the children arrived. Ms. Grant had been teaching for about 15 years and had been a speech pathologist before she started teaching. Ms. Grant told me that reading was her highest priority for these children and she was willing to sacrifice some other activities in order to provide a stronger

foundation in literacy. She believed that children with speech and motor disabilities could become skilled readers if they received good instruction early in life. “I think one of the most important things is catching these kids when their brains are nice and plastic and there’s a window of readiness for reading” (Grant, P1, 512-514).

When the children arrived in the classroom they each selected books and looked at the books independently during a 6-minute block each morning. “Literacy research supports that children should have daily silent reading and be read to daily, in addition to receiving reading instruction” (Grant, P1, 164-167). Ms. Grant used the Houghton Mifflin literacy curriculum, the same curriculum that was used in the general-education classes at Valley View School. Ms. Grant told me that she taught two literacy blocks each day and incorporated literacy into other activities throughout the day.

I always do phonics; I always do phonemic awareness.... I do 50 minutes in the morning and then I try to get in at least another half-hour in the afternoon.... Also, you know, you can work literacy into fun things. Like now we’re studying bugs and the coloration of bugs.... We’re also learning the color words in conjunction with those, so it’s pretty easy to move literacy into the whole curriculum. (Grant, P1, 273-305)

Reading Instruction

During one 50-minute morning literacy block in March, I observed seven different activities. The activities were fast-paced and Ms. Grant was lively and enthusiastic. Haley and Angela both appeared very engaged and attentive, as did most of the other children. The literacy activities are described below (P6, 8-48).

Reading sight words

There were 15 sight words on a word wall, arranged in three columns.

go	is	see
at	like	a
I	can	the
to	my	look
and	have	this

Ms. Grant called on each of the children to read one of the three columns of five words. Both Haley and Angela raised their hands to volunteer. Angela read the list as Ms. Grant pointed to the words from top to bottom, one by one. “Excellent! Who wants to read this next list?” Both Angela and Haley read their lists without help. The two of them seemed to be at the top of this class of seven children – volunteering, engaged, cooperative, and successful.

Listening for a Phoneme

In the next activity, Ms. Grant played a recorded song and the children were instructed to stand up each time they heard a particular sound in the lyrics. Ms. Grant modeled and participated in this activity, sitting on a chair facing the children, saying or singing the word as she stood quickly and then sat back down each time a word with the target sound was sung. Neither Haley nor Angela could stand and sit as quickly as was required for this activity. Angela never really got completely to her feet. By the time she had braced her arms against the table and started to rise, the

other children were sitting back down. However, both Haley and Angela were laughing and appeared to be enjoying themselves along with the other children.

Sorting Initial Sounds

In the next activity, Ms. Grant placed large pictures of two characters, Kiki Kangaroo and Fifi Fish, on either side of the top of a pocket chart. Kiki Kangaroo had a large *K* superimposed on her picture and Fifi Fish had a large *F*. Ms. Grant then held up smaller pictures and called on the children to come forward and put the small pictures under either Kiki Kangaroo or Fifi Fish, based on whether the picture represented a word that started with the /k/ or the /f/ sound. The pictures included: kite, king, kiss, key, fork, finger, fox, farm, and feet.

Reading Sentences

Ms. Grant created sentences by placing cards with words, pictures, and punctuation in the pockets of the pocket chart. The children were called on one by one to come forward and touch each word or picture as they read the sentences. “I like to go see my [horse picture].” “I like to [hug picture] my [cat picture].” The words on the cards were all in the sight word list on the wall.

Reading Decodable Words

Ms. Grant had written words on a whiteboard including man, can, cat, and pat. She called on children to come forward and erase a specific word. “Who can find and erase the word *man*?” Again, Haley and Angela raised their hands to volunteer for this activity. The children appeared engaged and seemed to enjoy the

activity of erasing the designated word from the whiteboard. The motor control required for this task was within Haley and Angela's abilities.

Making Consonant-Vowel-Consonant (CVC) Words

The next activity focused on making words in the 'at' family by adding an initial consonant. Several letter cards were available in the pocket chart for the children to add to 'at' to make new words. Ms. Grant managed to make this activity into a fun game and there was apparently an ongoing joke that Ms. Grant didn't like the word *rat*. The children also seemed to think that the word *fat* was very funny.

Reading Books

In the final activity of the morning literacy block, Ms. Grant provided each child with a copy of a small book made up of only a few pages, from the Houghton Mifflin curriculum. The title of the book was *Pat and Man*. Ms. Grant instructed the children to find the title and put a finger on the first word of the title. Then the children pointed to each word as they read aloud. The children read each page chorally; then Ms. Grant called on a child to read the page aloud individually while all the children finger pointed to the words. The text on one page read, "Pat ran and ran and ran." Each child received enthusiastic praise for reading.

In addition to the morning silent reading and 50-minute literacy block, Ms. Grant had a 30-minute reading comprehension and/or story dictation block in the afternoon and read to the children every day during snack time.

Participation

During one of my classroom visits I counted how many times each child was called on during a literacy lesson and found that Angela and Haley were called on more often than any of the other children. This may have been because I was there and Ms. Grant knew that I was interested in those two children. However, it was also – at least in part – because Angela and Haley were eager and engaged participants. Both children frequently raised their hands to volunteer (P5).

During the interview Ms. Grant reported that she made an effort to ensure the full participation of Angela and Haley.

Ms. Grant: We need to preserve their self-esteem.

Interviewer: Like in what ways?

Ms. Grant: Making sure that they are fully participating members of this class. Making sure they always have a turn. Making sure everybody waits and listens quietly when it is their turn. Just giving them status and respect is really important. I occasionally compliment them in a way that tells the other children that just because [Angela] can't talk doesn't mean she's not really smart. I often expect her to do things that are difficult, but make her feel included. Like when we do drawing, I give her the markers and I expect her to do something with that marker on that paper and then I ask her to tell me about what she's drawn. And she does. (P1, 693-708)

Technology

Angela in the Computer Lab

During one of my class visits in April, Ms. Grant's class went to their weekly visit to the computer lab. The lab had 35 older Macs in rows on child-size tables,

each with a child-size chair. After a few introductory words, the computer teacher began working at his computer, leaving the children on their own to play at the computers. The children appeared to be familiar with the games and activities on the computers and did not appear at all unhappy with this self-directed arrangement.

Angela took a seat by herself at a computer not far from the door. At one point another child came over to visit and to see what Angela was doing, but for the most part Angela worked alone. She was using a program for making greeting cards and she used a standard mouse to select graphics and text to create a Mother's Day card. My notes from that day read:

Angela seemed very confident on the computer to me. She worked hard to position the cursor on tiny buttons. It was slow and difficult for her and she sometimes had to click multiple times before she got it to work, but she was persistent and she knew what she wanted to do.... I was impressed with her independence and commitment to task. (P7, 61-76)

When the card was finished, Angela clicked on the print icon. The printer was located at the front of the room, near the teacher's desk. When the printer began to make noise, it got the attention of the computer teacher. He looked up as Angela began her slow shaky walk to the printer. When the card had finished printing, the computer teacher took it from the printer, glanced at it, said a few words to Angela that I did not hear, and handed it to her. Angela selected a marker from a bin on the desk, scribbled a few marks on the card, and returned to her seat at the computer near the door. It occurred to me that when Angela's mother received this card, she might assume that the card was the product of a class activity. It was unlikely that she

would know that it was through self-initiated effort that Angela had made that card for her.

When Angela returned to the computer after printing the card, she began playing an alphabet keyboard game, selecting the letters sequentially starting with A and moving through the alphabet. When it was time to leave, she quit the program in the appropriate manner before getting in line with her classmates to return to Ms. Grant's classroom.

Assistive Technology & AAC

Haley and Angela did not have the motor control to form letters accurately with a crayon or marker, so they used alphabet stamps to print letters and words on paper. Ms. Grant told me that Angela's mother was quite "technologically-savvy" and had asked if it would be okay for Angela to do her homework using a computer, rather than the stamp pads. Ms. Grant had agreed, and told me that she believed both Angela and Haley would need to use assistive technology for writing in the future; however, at that time there was not a computer or printer in the classroom.

Both Angela and Haley used their augmentative communication devices primarily for preplanned and preprogrammed activities. The complexity of the devices limited their functional use by the children.

Their speech therapist, [Mr. Zima], has said to me that the meta-language required to use these particular devices is really beyond the language skills of a typically developing 5-year-old. So, right now they're able to use the machines in a very rote fashion – like days of the week, family members, colors, weather and they're not really

able to use them to express anything novel or to express ideas
(Grant, P1, 195-204).

During my interview with Mr. Zima, he expressed disappointment that Haley and Angela did not have the opportunity to use their Pathfinders more frequently during class. Mr. Zima would have preferred to spend time with the children in the classroom, helping them develop communication skills using the Pathfinders.

I think the therapist should be tied right into the context of the class, right into naturally occurring events as they happen and when they happen.... So there ... [can be] clarifications when there are communication breakdowns. (P3, 254-259)

However, Ms. Grant reported that she found that arrangement to be problematic. As a result, when Mr. Zima was scheduled to work with either Angela or Haley, he met with them in a separate room. As Ms. Grant explained:

It's distracting for me. If someone else is teaching while I'm teaching, that's hard for me.... Mr. Zima and I tried it for awhile. So I was up there talking and then he was kind of talking to the child. And the child was very confused. She was kind of listening to Mr. Zima and kind of listening to me. And these kids already had language processing problems. Now they were trying to listen to two adults at the same time. I found that I would then wait for Mr. Zima to finish facilitating and then I'd lose track of where I was. (Grant, P14, 485-496)

Literacy Progress in Kindergarten

Ms. Grant reported that she was happy with Angela's literacy progress in kindergarten. Angela's phonological awareness was good. She was able to rotate initial consonants in CVC words to make new words. Ms. Grant reported that Angela

was the best sight-word reader in the class and had good listening comprehension skills. According to Ms. Grant, Angela was very close to achieving the skills of a typically developing kindergartener.

Year Two: Angela in First Grade

In the second year of my study Angela and Haley were again in Ms. Grant's combined kindergarten and first-grade class, this time as first-graders. Angela and Haley had their Pathfinder's on their desks, but for the most part, the children continued to use their voices and physical responses to answer questions and participate in class. As she did the previous year, Ms. Grant often asked the children to provide responses that required physical manipulation of objects in addition to speech, so that misunderstood responses could be minimized. For example, during circle time, Angela volunteered and was called on to tell what day of the week it was. To provide her response she moved to the front of the room, selected the printed text of the word *Wednesday* and placed it in the appropriate slot on the board.

Decoding Challenges

Ms. Grant continued to use the Houghton-Mifflin literacy curriculum that was used in the general-education classes at Valley View School and continued to make literacy a high priority in her classroom. For her first-grade students she continued instruction in decoding and expanded the writing component of the literacy instruction. Angela continued to learn new sight words, but Ms. Grant told me that her decoding stalled when the class moved from CVC words to decoding words with consonant blends.

We finished the CVC word families and then went on to CCVC with blends and then digraphs and she kind of bogged down because she doesn't articulate those sounds and she really doesn't hear them.

(Grant, P14, 44-46)

Ms. Grant described to me a strategy that she developed to help Angela and Haley better hear the consonant blends. She created a game in which the children were given cards attached to popsicle sticks; each card had a consonant blend, such as SL, SM, or SP written on it. Ms. Grant would say a word that started with one of the blends and the children were to hold up the sign that corresponded with the blend they heard in that word. At first Ms. Grant exaggerated the sounds of the blends, and as the children got better at the task she normalized her articulation. "We did a lot of auditory training around simply hearing the blends and then they were a little more successful" (P14, 69-70).

Writing with Technology

In the children's first-grade year, computers and a printer were added to Ms. Grant's classroom. Ms. Day, a technology assistant, provided support to Angela and Haley during writing activities. Although Ms. Grant continued to require that Mr. Zima work with the children outside the classroom, she found Ms. Day's presence valuable.

It wasn't distracting to have Ms. Day in here at all. If someone else is teaching while I'm teaching, that's hard for me. But in terms of Ms. Day, who was the adjunct tech assistant, that was wonderful because she would listen with the child to my instructions and then they would go off and work together.... [Ms. Day] would sit

between [Haley and Angela] and they'd each have their own computer. (P14, 496-498)

Ms. Grant reported that Angela struggled with formulating sentences and generating ideas to write about.

I was using a standard writing program and it got a little hard. [Angela] wasn't able to generate ideas for writing. So we digressed to writing group stories. What shall we write about? And maybe one of the children would say, "Let's write about a dog." Okay. Where did the dog go? Well then somebody else would say, "To the park." Okay, give me a whole sentence. And she kind of got the idea of story writing through writing group stories.... But, she still had trouble with ideation, formulating ideas. She would actually become quite resistant and kind of just put her head down and not budge. But that improved tremendously over the year. So by the end of the year I think her writing skills improved quite a bit. She was never to the point of writing a story, though. (P14, 96-112)

Ms. Grant reported that the class also did journal writing once a week and Angela had the same difficulty with that writing format, "Angela could never think of anything to write in her journal. It was always a struggle" (P14, 407-408).

Spelling and Grammar

I asked whether Angela and Haley were able to generate the spelling of words independently.

Ms. Grant: They had a lot of trouble with spelling.

Interviewer: Did they do any invented spelling?

Ms. Grant: Yes. They did. But it was hardly – it wouldn't be typical invented spelling. They may have the initial consonant and then it would be pretty far removed from the real word. (P14, 230-236)

Ms. Grant provided an example of Angela's invented spelling from April of her first-grade year:

It is had to mawr. I dut ilke to mawr.

Angela's family was moving to a new home; she told Ms. Grant that she had written, "It is hard to move. I don't like to move." In another example, Angela had written:

I like the pil.

Ms. Grant translated this sentence as, "I like the parrot." Ms. Grant reported that Angela struggled with many aspects of writing and composition:

There were a lot of missing articles. She was speaking kind of telegraphically and that translated into her writing. She had a lot of grammatical errors, a lot of problems with verb-noun agreement, missing morphological endings. Those got better as I got more direct in my instruction. I found that I had to really teach both Angela and Haley every single thing, "Listen to me, that word has an s on it. That means more than one." Whereas kids usually just normally acquire that, I had to do a tremendous amount of direct instruction, particularly on morphological endings and verb-noun agreement.

(P14, 132-139)

AAC Use and Mr. Zima

Mr. Zima worked with Angela on all aspects of language and communication, including written communication; he provided a great deal of support and scaffolding for the writing process. Angela kept a diary as part of her work with him. She made entries in her diary using a laptop computer and Co:Writer,⁴ a software program that provided word prediction. In word prediction, as

the user begins to type a word, the software provides a list of words from which the user can choose, based on the letters typed. The user can either select a word visually from the list or the computer will read the list aloud to aid the user's selection. As the user types additional letters, the software narrows in on the word. Mr. Zima reported that using Co:Writer facilitated writing tasks for Angela. Because Angela usually knew the first letter or two of words she wanted to write, she was often able to find the word she was looking for on the prediction list. However, word-prediction software did not enable Angela to write independently. If the word she wanted did not appear after the first or second letter she typed, her chances of finding the word were greatly reduced; as soon as she typed an incorrect letter, the word would be eliminated from possible list entries.

When Mr. Zima arrived, he and Angela went off to a portable classroom to work together and I joined them. Angela had been keeping a diary and making entries with Mr. Zima's help. I observed as Angela read a previous entry, "I want a real dog, but I didn't get a real dog. I got a toy dog." She read quite slowly and needed help from Mr. Zima, despite the fact that these were her own words, written the previous week. Mr. Zima talked with her about what she wanted to write next. He helped her to clarify and expand it. When she was happy with the content, he quickly jotted it down. Then Mr. Zima supported her in the process of sounding out the words and typing them on the laptop. Mr. Zima provided word by word support, isolating phonemes and helping her find the words in the prediction lists. It took the

full 50 minute session with Mr. Zima to read the previous entry and then write the sentence, “I want a real dog and I want it right now” (P23, 14-31).

Literacy Progress in First Grade

Ms. Grant reported that Angela had good phonological and phonemic awareness. Although she was very good at phoneme deletion and substitution tasks in isolation, particularly when there was a lot of rehearsal, she struggled to use those skills successfully to decode unfamiliar words. Angela continued to acquire new sight words, but she relied more on contextual and picture cues than phonetic cues to identify words, according to Ms. Grant. Ms. Grant reported that Angela’s comprehension was very good:

I think her listening comprehension is excellent for stories. In fact she was one of the better kids when you would ask comprehension questions at the end of a story. She would ... not only recall the details of the story, but answer more in depth questions like predictions, what would happen next, or what do you think this character was feeling? How would you feel if that happened to you? She was one of the more able kids in the class.

However, when reading independently, her slow halting pace interfered with comprehension:

[Angela] would read quite slowly, to the point where the sentences wouldn’t hang together enough that she could understand the sentence. She relied very heavily on pictures, so her comprehension was impacted by that. (P14, 78-80)

I asked how much progress Angela had made through the general-education first-grade curriculum.

Teacher. Maybe the third month of first grade.

Interviewer. So, she would not be able fit into a second-grade class?

Teacher. No. But maybe a first grade. And that would be true of Haley too.... They kind of finished up kindergarten and then moved slowly into the first-grade curriculum... Everything took a lot longer. (P14, 428-439)

I asked Mr. Zima for his assessment of Angela's progress. "[Angela has] really great sound-letter correspondence. So right off the bat, she has very strong inner speech (Zima, P15, 455-456). Mr. Zima provided the example of the word *long*, which Angela could not articulate correctly, but knew its initial letter, "So she says the word 'yong' but her fingers go right to the [keyboard key] L. So that shows she's got it. Inside, she hears it. She knows it, but she can't produce it" (456-457).

Characteristics that Impact Literacy

I asked Ms. Grant if Angela had other issues or characteristics that might interfere with learning to read.

I think she was considerably more dependent than Haley – not a self-starter. Like we'd give them a task and Angela would just sit and wait for prompts or wait for somebody to come over, wait for somebody.... And school was work for her and I don't think she particularly liked school... School was hard. I know we tried to intersperse it with games and really fun stuff. But, at some point you really do have to apply yourself. You really have to look at that word and you have to go into your head and struggle to decode.... But, she loved reading. When we would do choral reading, she was always really excited when we were starting a new story. She would always point out really interesting details of the pictures and have

her favorite characters. She loved talking about the stories ... and she loved creative dramatics and has a wonderful imagination, but the nuts and bolts of having to apply herself to decode, she was ... less motivated ... to do the hard work. (P14, 283-314)

Ms. Grant mentioned another characteristic that became more pronounced the following year. Of the three children in the study, Angela's speech showed the most improvement, yet, she was the child who became most upset and discouraged when she was not understood. "She was also much less likely to repeat if I didn't understand.... Angela would become much more easily discouraged if I didn't understand her the first time" (P14, 526-529). Yet Ms. Grant's expectations for Angela's literacy development remained high.

I believe she'll learn to read. She'll just be a little later, a little slower. I absolutely think she'll learn to read. I have a lot of really positive feelings about that and a lot of hope for her. I see her going to college probably. I really do. She's a bright little girl. (P14, 323-326)

Year Three: At Birch Bay School

In the third year of the study, Angela moved to Birch Bay Elementary School. This was her second-grade year. She was participating in a new special education program that the district had started to better meet the needs of students who used augmentative communication and assistive technology. There were only three children in the class, Angela; her sister, Alexa; and Jason, a second-grader who also used augmentative communication. By this time, Angela no longer used her

walker at school. Her gait was slow and a little unsteady, but she was able to make her way through the hallways at school without physical support.

Angela's teacher at Birch Bay School, Ms. Parker, had received her teaching certification the previous June in special education with a focus on children with severe and profound disabilities. Ms. Parker had many strengths. She was hard-working, committed, technologically competent, unflappable regarding disability issues, and committed to problem-solving. However, she had little training or experience in literacy education and often spoke of her own dyslexia. She placed considerable emphasis on physical, behavioral, and social development. Both Mr. Zima and Ms. Day continued to work with the children each week, and the children received services from occupational therapists during the school day. In addition, there was a full-time instructional aide in the classroom, Ms. Clark.

While morning-circle activities in Ms. Grant's class had emphasized literacy activities, morning-circle time in Ms. Parker's class often focused on learning sign language and dexterity and movement activities. Some mornings the children straddled, balanced and bounced on large therapy balls that were shaped like giant peanuts. One morning-circle activity that I observed included a lesson on how to fall down without getting hurt. Ms. Parker provided the signs for many words as she spoke, "Yesterday we did some singing [she provided the sign for *singing*] and we talked about falling down [sign for *falling down*]" (P32, 27-28). On a few occasions when I was present, the teacher played a CD of the song *Knick-Knack-Paddy-Wack*,

and the children made the signs for each of the numbers from one to ten, as they sang each verse of the song.

Assistive Technology

In the special education classroom, each of the children had a workstation with a laptop computer and printer where they completed all of their written work. Angela used a standard keyboard and mouse. The children had access to books on CD and children's software that they could explore independently. Each computer was set up with a headset so the children could work individually without disturbing one other.

By the third year of the study, there was little emphasis on having Angela learn to use her AAC device. However, even though her speech had shown considerable improvement, she remained difficult to understand without a known context. Mr. Zima had given her a small laminated alphabet to use to indicate initial sounds or to try to spell words when she was not understood. Although she tried using that on occasion, at other times she refused to repeat or try to clarify what she had said. On several occasions she broke down in tears when she was not understood. Ms. Parker told me, "She is so frustrated with not being understood that she gives up" (P29, 429-430).

Instruction and Inclusion

In October of their second-grade year, Angela and her classmate Jason began spending a good portion of each day included in a second-grade, general-education class. When I observed her in the general-education inclusion classroom she seemed

to be a model student; she was focused on the teacher and quick to follow the teacher's directions. Ms. Parker commented, "She certainly pays better attention in general ed ... than most of the students in the general-ed class" (P29, 452-453). When Angela and Jason went to the inclusion classroom, they were always accompanied by either Ms. Parker or Ms. Clark, the instructional aide. They took the laptop computers with them to the classroom each day. Although in many ways, Angela fit in well with this class and the content of the instruction seemed appropriate to her abilities, the texts used in the class were well beyond her ability to read independently; so either Ms. Clark or Ms. Parker read the material to Angela. Mr. Zima assessed Angela's ability to read one of the second-grade texts and determined that she was able to independently read about 67% of the words. Nonetheless, her listening comprehension of the content of the texts was excellent, "When it comes to the comprehension piece she's actually almost above the general-education students" (Parker, P29, 128-129).

Literacy instruction in the second-grade, general-education classroom emphasized vocabulary development, grammatical conventions, reading comprehension, and composition. I observed one day when the class was working on a capitalization activity. The teacher had written several sentences on the white board that had capitalization errors and asked the children to volunteer to come forward and make the necessary corrections. Angela raised her hand and was called on. As Angela walked to the front of the room and was handed the marker, I wasn't sure what she would do. I had never seen her write with anything other than a rubber

stamp or a computer. Angela went to the board and drew a large shaky slash through the lower-case h that started the name Harry Potter. She then, slowly and deliberately drew a foot-high, somewhat wavy, upper case H on the board. When she had finished, she put down the marker and walked back to her seat with a smile on her face.

In November, Angela learned that the children in the second-grade class where she was included would be taking spelling tests. Most of the words on the spelling lists were beyond her reading ability. She became very concerned and wanted to study the spelling words at home in the evenings. As it turned out, the spelling tests were given at a time of day when Angela was not present. However, Mr. Zima took the opportunity of her interest in spelling to give her a spelling test that he thought would be more in keeping with her skill level. Mr. Zima's test and Angela's responses follow:

Word given orally	Angela's spelling
fan	fun
pet	pet
dig	dig
mop	mog
rope	rop
wait	wet
chunk	tac
sled	set
stick	het
shine	sin

A large portion of the time in her special education classroom was spent either preparing for inclusion or completing assignments that had been started during general-education inclusion. When I interviewed Mr. Zima toward the end of the school year, he provided his assessment of the strengths and weaknesses of this arrangement.

The teacher's strength at Birch Bay is driving inclusion, making sure the kids are included, making sure that their physical disabilities are addressed, their physical needs are addressed, getting [accessible] bathroom stalls put in and advocating for people with physical disabilities. That's been a powerful strength. But expecting that they're going to get anywhere with literacy in a general-education classroom just using assistive technology to try to keep up with these other guys, it's not doing anything for their literacy ability. (P28, 186-193)

Mr. Zima felt that Angela's greatest strength was her desire to learn and succeed. However, her lack of strategies for decoding unfamiliar words presented a barrier to her reading success: "[Angela lacked] a set of strategies ... the orthographic knowledge and the repertoire of letter patterns and having the ... awareness of those digraphs and blends and vowel teams and vowel patterns" (P27, 540-542).

The following description is taken from my field notes in document P32, lines 57-116. I accompanied Angela and Ms. Clark to the inclusion class on a day when the assignment was to create a newsletter article about a class activity. On a previous day, the class had brainstormed to create a list of possible topics for their articles. The teacher told the class to begin by creating a chart with answers to the

questions: *who*, *what*, *when*, *where*, and *why*. They were then to use the information in the chart to write sentences for the article. There were about 13 or 14 items on the topic list. Ms. Clark read the list to Angela. Angela selected the topic, “We made valentines in art class.”

The other children in the class were quietly working at their desks. Ms. Clark reminded Angela to start Co:Writer, the word-prediction software she used for writing. Angela successfully initialized the application. Then she slowly typed her name. Ms. Clark gave her a copy of the list of topics and said, “That is your first sentence,” pointing to the topic Angela had selected, earlier. There was no mention of creating a chart with *who*, *what*, *when*, *where*, and *why*. Angela copied the sentence from the sheet, sometimes selecting the appropriate word when it appeared on the word-prediction list and sometimes typing the whole word. When she had the complete sentence typed she stopped, until Ms. Clark asked her what she wanted to say next. “I don’t know,” replied Angela. Ms. Clark asked what the valentine was made of. “Clay,” said Angela. Ms. Clark replied, “But we can’t just type clay. We have to make a sentence.” At this point the language arts period was over and Ms. Clark, Angela, and Jason headed back to the special education classroom.

When they got back and had the laptops set up at the children’s workstations, Ms. Clark provided some suggestions for sentences that Angela might want to write. Angela selected the sentence, “My heart vase was made of clay.” Ms. Clark helped Angela with the sentence, word by word. “What letter does vase start with?” “I see it on the list, do you?” Ms. Clark went back and forth between the two children. Each

time she attended to Jason, Angela's progress came to a halt. Ms. Clark pronounced each phoneme in the word clay. After Angela had typed c-l-a, Ms. Clark asked, "What is the last sound in clay?" Angela was silent. Ms. Clark changed the question, "Do you know the last letter in clay?" Again, there was no response. "It's the same letter that happy ends with." Angela was silent. "What does the word happy end with? It's a vowel, *a e i o u* and sometimes – ?" *Y*, said Angela. "Right!" said Ms. Clark. There was no explanation or discussion from Ms. Clark about *ay* as a common rime. There was no word wall and there were no lists of word families on display in the classroom. Angela received no information that might help her the next time she wanted to spell or decode a word that contained the letter pattern *ay*.

In the second half of the school year, Angela's parents expressed their concern about how little reading instruction their daughters were receiving. Their mother, Ms. Clark, and I attended a training session on *Sound Partners*,⁵ a one-to-one, phonics-based tutoring program for beginning readers. Ms. Parker supported the activity, but was unable to attend the training because of a conflict with a university class that she was taking. Initially, the plan was to use the *Sound Partners* curriculum to work with Angela and Alexa during the school day. However, Ms. Parker was unable to find time for the tutoring during the children's school day without sacrificing other activities, so Angela's mother took on the task of providing the tutoring herself to both girls at home.

Angela's Literacy Progress

When Angela's mother started working with Angela using the Sound Partners program, she found that Angela continued to struggle with CVC words that she seemed to have mastered in previous years. She confused as-is, wig-wag, tin-tan. When I read with Angela, she often appeared to be guessing from context, rather than looking at the words. For example, she read a book about *Clifford the Big Red Dog*,⁶ in which Clifford was the winner of a race. The final page read, "Clifford is the top dog." Angela read instead, "Clifford is the winner."

In May of her second-grade year, Ms. Parker reported on Angela's IEP:

[Angela reads] over 134 basic sight words, but does not read them with automaticity. She reads orally 30 words correct per minute at pre-primer level, 28 words correct per minute at primer level, and 13 words correct per minute at first-grade level.... Her oral reading (decoding) skills are at the primer to beginning of first-grade level. She struggles with decoding words, and does not read fluently or with any expression. (P41)

Ms. Parker reported that Angela's reading comprehension was significantly higher than her decoding abilities.

She accurately identifies story elements (setting, plot, character). In her second-grade inclusion class she shows great skill in making connections between texts and real life, and understanding and analyzing the relationship between and among informational/expository text and literary/narrative texts. (P41)

With regard to her composition skills, Mr. Zima wrote, "[Angela] is able to complete sentences for assignments and enjoyment purposes, provided with

appropriate prompts and cues; however, she does not currently write sentences independently” (P41).

When I interviewed Ms. Parker at the end of the school year, I asked her to identify Angela’s major strengths and weaknesses.

Her strength [is] that she’s incredibly smart.... My biggest concern ... is that she always wants to have the right answer.... She’s very driven and she’s a very sensitive kid. I think those are going to be great assets for her down the road.... If she can just be more comfortable with having the wrong answer sometimes, because she drives herself a little bit too hard. (P29, 404-418)

CHAPTER FIVE: PORTRAIT OF HALEY

Year One: Haley in Kindergarten

From my first observations of Haley during her kindergarten year, I found her to be an enthusiastic and eager participant in school activities. I was in Ms. Grant's classroom on May 1st of Haley's kindergarten year when the children arrived at school in the morning. The following is an excerpt from my field notes:

When Haley arrives she is excited and points at the calendar to point out the new month. The teacher acknowledges her observation and points it out to the other children. "Haley, what did you notice this morning?" Haley points excitedly to the word May on the calendar.... [Later, during morning circle] Haley is selected to put the 1 on the calendar for May 1. She is grinning and pleased. I later learn that May is Haley's birthday month. (P7, 6-11)

Haley walked independently and could run and jump. Her gross motor skills, though awkward, were considerably better than Angela's. Yet Angela had better fine motor control than Haley. Of the three children in my study, it was Haley whose speech was least intelligible to my ear; she was also the child who was most enthusiastic about using her communication device. Ms. Grant reported that Haley's speech was inadequate to meet her communication needs, "And the speech therapist doesn't expect that it ever will be. She is actually much more motivated to use her Pathfinder than Angela" (P1, 231-234). Mr. Zima reported, "Haley often hugs her device ... [and says] 'I love my Pathfinder!'" (P3, 683-690). However, during my visits I rarely saw the children use their communication devices at times other than

when they were working one-on-one with Mr. Zima or playing back pre-recorded messages. During a class visit, I arrived before the children and Haley's Pathfinder was on her desk, apparently not taken home with her the night before. Ms. Grant described the children's use of the communication devices in her class:

Everyone comes Monday morning with something to share and their parents have helped them program what they would like to share into the Pathfinder. When it's their turn they dial-up the Pathfinder and share what they have to say and usually it's several sentences of all the things they did over the weekend (P1, 386-393).

One spontaneous use of the device that I observed was when Haley provided her sister's name during a conversation about who had birthdays that month. During my interview with Ms. Grant she told me about Haley's use of her Pathfinder that day:

Today Haley actually had a scuffle, or disappointing interaction, on the playground. She came in and she put her head down and I said, "Can you tell me how you're feeling on the Pathfinder?" She got her Pathfinder and pushed sad, like three times, "sad, sad, sad." Then I was able to say, "Oh you're feeling sad; what was it about?" She was able to point to Josh and then I could bring Josh over and they resolved their misunderstanding. (P1, 206-216)

Ms. Grant also used Haley's developing literacy skills to aid communication, when her speech was not understood. Ms. Grant had taped an alphabet to Haley's desk and she asked Haley to point to the initial letter of words that could not be understood. Ms. Grant reported that this communication strategy was sometimes, but not always, successful.

During her kindergarten year in Ms. Grant's class, Haley was exposed to the daily, systematic literacy instruction that was described in the previous chapter. Like Angela, Haley was a full participant in classroom activities.

Mr. Zima Works with Haley

Because Ms. Grant did not want Mr. Zima to work with the children in the classroom, when Haley was scheduled to work with Mr. Zima, she left the classroom and met with him in a small storage room. I observed one day as Mr. Zima helped Haley program a message into her Pathfinder. Mr. Zima asked, "How do we add a message?" Haley pointed to a key on the Pathfinder. "Right; we open the toolkit." She seemed to understand the process and was focused on the task. Mr. Zima segmented words for her, providing phonetic prompts. "*Feel* – okay that has three sounds /f/ /ee/ /l/." He held up three fingers touching one as he vocalized each sound. "What letter do we use for /f/?" Haley selected the *F* key on her Pathfinder. "How about /ee/?" She selected *E*. Mr. Zima told her that there were two *e*'s together in this word and prompted her to select another *e*, which she did. Mr. Zima presented the final sound in the word and Haley correctly selected the letter *L* to represent the /l/ sound. Next, he held up five fingers for the word *upset* and touched a finger as he vocalizes each sound. He slowly ran through all five phonemes, pronounced the word twice, and then asked her to select the letters one-by-one as he touched a finger and pronounced the phonemes one more time. I was impressed when she correctly selected the letter *u* for the sound /u/ – not an easy task for a kindergartener. When

provided with the phonemes one-by-one, she correctly identified all five letters in *upset*. (P4, 31-50).

Literacy Progress in Kindergarten

When I interviewed Ms. Grant in May of Haley's kindergarten year I asked about Haley's literacy progress. Ms. Grant told me that because her speech was so difficult to understand, it was sometimes a challenge to evaluate her reading and responses to questions:

With phonological awareness it's hard to tell. If I have her do a deletion task, like "say cowboy without cow" – I think sometimes she gets it, but it's very hard to tell again because of her articulation (P1, 112-116).

Concerning decoding skills, she's very close to being at grade level (P1, 86-87). She can read at least 15 sight words and she can also point to them if I scramble them. So, I have a pretty good idea that she's reading them... She is pretty familiar with both the 'at', the 'an' and the 'it' word families. She can rotate initial consonants to create words. Occasionally, she will create what we call a make-believe word – it's not a real word (P1, 70-81).

Concerning listening comprehension – her answers are very concrete and telegraphic. I don't know if that's because her expressive language is so limited or if her thinking tends to be a little concrete.... She has a very difficult time predicting outcomes. If we talk about the characters of the story and characteristics of those characters – Are they nice? Are they happy? Are they sad? – she can usually get gross kinds of descriptors but would have trouble with more subtle descriptors. (P1, 87-99)

I think she does have some deficiencies generally in her vocabulary and in her experiential base. So I think that interferes a little bit with some aspects of reading, but not all. (P1, 81-85)

Year Two: Haley in First Grade

In the second year of my study, Haley, like Angela, continued in Ms. Grant's combined kindergarten and first-grade class. When I visited the classroom in spring of their first-grade year, the children were learning to read digraphs and consonant blends. Like Angela, Haley's reading progress began to falter when the class moved beyond CVC words:

Haley had a hard time with blends. And I don't think she ever heard them as well. I don't think her phonemic awareness is nearly as good as Angela's, which I think has also caused me some concern about being sure that Haley would be a reader. I think Haley's going to be a reader, but it will be more of a struggle. (Grant, P1, 380-383)

Writing and Composition

Like Angela, Haley struggled with grammar, verb-noun agreement, and morphological endings, "And they always left out articles and prepositions and conjunctions" (Grant, P14, 140-141). Haley struggled with spelling and was less successful than Angela at using word-prediction software. When Haley used the software, she sometimes selected the wrong word from the list presented. In those cases, her writing did not contain the words or meaning she intended and sometimes made little sense. During her first-grade year, her family decided that they did not want her to continue to use the word-prediction software. In contrast to Haley's

challenges, Ms. Grant reported that Haley also had many positive assets that served her well at school:

Attention is better than Angela across the board. She likes school; she's here to work; she loves math; she loves reading; she wants to succeed. She's really interested in getting her job done and she's well motivated by praise, stickers. She's internally motivated and very, very proud of her successes. When she writes a story she takes it around and shows it to everybody. She's just an incredibly enthusiastic learner. (P14, 368-373)

Haley was an enthusiastic writer and, unlike Angela, Haley had no difficulty thinking of topics about which to write:

We journaled on Friday and Haley always had something that she wanted to say in her journal: her grandma came to visit, [it was] her sister's birthday, she gave her dog a bath. She just had tons of stuff to say in her journal (P14, 405-407).

[Haley's] attention span is longer and her energy is better [than Angela's]. She focuses better. She doesn't get as discouraged as Angela does (P14, 344-345).

[When she wasn't understood] Haley would find a new way to say it, use gestures, repeat two or three times until I got it. (P14, 526-528)

Working with Mr. Zima

Haley continued to work outside of the classroom with Mr. Zima on communication, both conversational and written. I observed them working together on a story that Haley wanted to write about Frog and Toad. The story was a project that they had been working on over multiple sessions. Because Mr. Zima wanted to

help Haley use her Pathfinder more effectively for communication, he chose to have her write her story using the Pathfinder icons, rather than conventional orthography and spelling. However, Haley did get some practice with conventional spelling, writing, and reading when she worked with Mr. Zima using the Pathfinder for composition. When an icon sequence was unknown, one could type the word on the Pathfinder and the software would display the correct icon sequence. Haley and Mr. Zima often used this approach to learn new icon sequences; Mr. Zima segmented words into phonemes and Haley typed the words on the Pathfinder.

When Haley had finished her story, Mr. Zima printed it out and stapled the pages together like a book; it had a cover and two pages. When he handed the book to her she hugged it to her chest, danced around the room with it, and then brought it over to show it to me. I had been a non-participant up to this point, just sitting to the side observing and taking notes. Haley opened the book and pointed to the words. I admired her story. She appeared very proud and pleased with herself. The text read:

This is a book about Frog and Toad. Frog and Toad went to the store. They bought some cookies to bake. When they got home, Frog and Toad turned the oven on. They had to turn the stove on because they had to heat it up. The next thing that they did was cut up the cookies. They put the cookies in the oven. They had to wait 20 minutes for the cookies to bake. They went to sleep when the cookies were baking. When they got up the cookies were ready ready [sic] to eat. The end.

Literacy Progress

Ms. Grant reported that Haley's language development was a couple of years behind that of a typically developing child her age.

She just doesn't have the language skills that Angela has.... I think she's probably a couple of years delayed in terms of language (P14, 352-358).

I think [comprehension] was pretty good. She was older. She was 8 by the end of [her first-grade] year. I think her listening comprehension was definitely as good as a 5- or 6-year-old. And 5-year-olds can be pretty sophisticated. I wouldn't say it was at age level, but it was good. (P14, 638-641)

At the end of the school year, I asked Ms. Grant about her expectations for Haley's future literacy development.

You know, I don't know. I don't know. Haley made pretty steady progress but the more complicated the tasks became, the slower it was. But she is so incredibly motivated and she is such a hard worker, she wants to learn to read so badly that I would think that those personality characteristics would hold her in good stead for learning to read. She's going to have more trouble, I think. (P14, 331-336)

Year Three: Second Grade at Valley View

In February of Haley's second-grade year, there was an unanticipated development in her life; she was diagnosed with a profound hearing loss in one ear. When I interviewed Haley's mother that spring, she told me how unexpected this information had been:

It totally floored us that we didn't know this until this year – that she is ... essentially deaf in her right ear. And though her tests all along have not revealed that, people are thinking that maybe we just got it wrong with the testing and she's probably had this all along. It just kind of blows us away how we could not know this about her. But, in many ways I think that is the case. (P26, Interview with Haley's Mother, Year 3)

Her mother shared with me her thoughts about how the hearing loss may have impacted Haley's attention or understanding in the past:

Actually ... the night we found this out I was reading [Haley and her sister] a story ... and I think I was sitting on [her sister's] bed or things were just oriented so that Haley was lying on her left ear to listen and I can hear myself sometimes saying things like, "Haley, are you with us here? Are you listening to the story?" ... And now I'm thinking, it probably had to do with where I was sitting in the room. So now when we read, I sit on her bed or she positions herself, if she wants to be lying down, she's on her right ear. But now she'll also say things like, "I can't hear you." So I think of all these missed things like that that were probably happening along the way. And she didn't have the language for it because she didn't quite know ... why she could sometimes hear stuff and other times she really couldn't. (P26, 423-434)

Second Grade Classroom Experiences

In the third year of this study, when Angela moved to the new program at Birch Bay School, Haley remained at Valley View. She was in a combined second and third grade special education class with eight other students. On my first visit to her classroom that year, I arrived while the children were still at lunch recess and I

spent some time looking around the classroom. The following observations are taken from document P38.

There were several large posters with hand-printed writing on display around the room. The posters covered a variety of topics; some of the headings included: How do you decide what to wear? The Seven Continents of the World, Room 25 Birthdays, and *Mrs. Piggie Wiggle*. On the *Mrs. Piggie Wiggle* chart was written, “Who are the characters? What is the setting?” Ms. Matthews had tacked to the poster newspaper reviews of a play about Mrs. Piggie Wiggle and papers the children had written after seeing the play. There were books all over the room: in bins, on shelves, on tables, and on the blackboard ledge. There was a laptop computer at Haley’s desk; she was the only child with a computer on her desk.

In addition to using technology for writing assignments, this year Haley had begun using a pencil for some writing activities. Haley’s mother told me that the previous year, when Haley wrote her first name, it would fill an 8 by 11 sheet of paper. Now, she was able to write letters that were an inch high or less. Writing by hand took considerable effort and concentration for Haley and the product was shaky and irregular.

Unlike Ms. Grant, Haley’s second-grade teacher, Ms. Matthews, was happy to have Mr. Zima work with Haley in the classroom. He spent 90 minutes twice a week providing support to Haley within the classroom setting. As I wandered around the classroom on my first visit, Mr. Zima was scanning worksheets and loading them into Haley’s laptop computer.

As the children returned from recess the teacher called out, “Silent reading time!” Each child selected a book and settled down somewhere in the room. Some sat at tables, others at their desks, and others on pillows on the floor. Haley took the book, *How to Make a Mud Pie*⁷ from inside her desk and sat down to look at the book and to read. After five or six minutes of silent reading, the teacher called the children back to their desks, which were arranged in a semicircle facing the front of the room.

The children were working on a writing project. The teacher asked the children to think about the elements of the stories they were working on. “Think about the setting of your story.” Ms. Matthews asked the class, “What does *setting* mean?” The teacher called on Haley. “Where,” Haley answered. “Yes, setting answers the question ‘where?’” responded the teacher. “Happen,” said Haley. “Yes”, said the teacher, “where it happens.” Ms. Matthews asked for examples of settings. Haley provided a response I did not understand. Ms. Matthews replied, ““At school,’ very good,” and wrote *at school* on the board. The students provided many creative suggestions for settings including outer space, Africa, Australia, at the space needle, on the roof, and in the rainforest.

Composition with Mr. Zima

The children began the writing project by filling out a worksheet about the parts of their story: title, author, illustrator, setting, character, and plot. The plot was to include a problem and its resolution. Mr. Zima worked with Haley to complete her worksheet. Haley used the Pathfinder icons to enter the text. When it came time to

create the plot, Mr. Zima suggested some ideas based on the characters and setting Haley had previously selected. Haley did not go with any of his suggestions. “Let me think”, she said, “I have to think.” She came up with the following problem for her story: “They’re at home. They’re having Christmas. It’s a big party. They’re tired but they don’t want to go to sleep.” Mr. Zima gave her a high five. “You thought it through and you came up with your problem!” Haley entered the plot of her story on the worksheet using the Pathfinder and laptop with support from Mr. Zima. The following observation is from my field notes:

Mr. Zima, prompts, encourages, and praises. “You know that word; it’s always in the same spot,” says Mr. Zima. He helps her with the word sleep. “What picture do we start with?” asks Mr. Zima. “Bed,” she says. “That’s right. Then verb,” says Mr. Zima. “That’s the problem,” says Haley. High fives again. She turns to me and points to the monitor with a big grin. She appears very happy with her work. When it prints out she hugs Mr. Zima. She shows me the paper, very pleased. “Now let’s work on the next page,” says Mr. Zima. (P38, 113-133)

When the bell rang for recess Haley hadn’t finished her assignment and expressed disappointment. She asked Mr. Zima if she could finish while the other children went to recess. “I can stay for a little bit,” he said, “but ask your teacher.” Haley asked Ms. Matthews, who gave her okay. Haley jumped up and down with apparent glee at the opportunity to continue working through recess. By the time the other children returned, she had finished and was very pleased.

Literacy Activities in Science Instruction

After recess it was time for science instruction. The class was studying weather. Literacy activities, including choral reading, writing, and vocabulary, were incorporated into the weather lesson. Ms. Matthews had written several weather-related words on the board and the children read, pronounced, and defined them. “How many syllables in *Meteorologist*?” Ms. Matthews asked. The children stood up and stamped their feet to count the syllables as they pronounced *meteorologist*. Haley raised her hand to ask a question. When called on, she got out of her seat, went to the board and pointed to the word *forecast*. “How do they do it?” Haley asked. Ms. Matthews repeated the question, then said, “That’s a very good question.” The class discussed weather prediction and Ms. Matthews asked if any of them had ever looked at the weather forecasts in the newspaper. No one responded that they had. Ms. Matthews asked the instructional aide to get a newspaper from the teachers’ lounge so that the children could look at the weather forecast in the newspaper. Haley seemed especially interested in the newspaper forecast. Several weeks later, when Haley’s mother filled out the questionnaire about Haley’s use of print materials at home, she reported that Haley used the newspaper to check the daily weather forecasts.

Reading Groups

Ms. Matthews conducted reading group activities every day. In these activities, the class of nine students broke into groups and worked on a literacy activity for 20 minutes and then switched to another activity for 20 minutes. The list

of the division of groups and activities was written on the white board. There was a brief silent reading period before breaking into reading groups and those children who needed help getting started with their activities continued reading while they waited for the teacher or instructional aide to help them get underway. Haley was reading *Iris and Walter: The Sleepover*⁸ for silent reading. Haley used a cardboard bookmark, held horizontally, to help her keep track of her place on the page. Mr. Zima told me that without a card or marker to help her keep track, she sometimes skipped several lines when she moved from the end of one line to the beginning of the next.

When they broke into groups, Haley and her classmate Missy were assigned to work together. They sat across from each other at a small table and Ms. Matthews wrote down instructions for them in large print with a felt tip pen. They were reading *The Kite*,⁹ from the Houghton Mifflin reading series. The following observations are from document P40.

The teacher said, “Both of you girls have read *The Kite* with me. Now you’ll read it together.” She wrote down what she wanted them to do: read *The Kite* together; take turns. “Then what?” asked Haley. “Then you’re going to look for contractions. Do you remember what contractions are?” The teacher provided the two girls with a quick review lesson on contractions. Ms. Matthews sat with them as they got started.

Missy read first and when she paused on a word the teacher asked, “Haley, do you know that word?” Ms. Matthews encouraged the children to help one another

figure out unknown words. When it was Haley's turn, she needed help with the words *isn't* and *easy*. "Nicely read!" said Ms. Matthews, when Haley finished her page.

Ms. Matthews asked them to look on the first page for contractions. They both said they didn't see any. "Take a good look!" Then Haley found *she'll* and was very excited. Her teacher shared her enthusiasm. "Now we're going to write that down and the page number where you found it." Ms. Matthews then left the children to work independently. As they read, Haley found the word *doesn't*. She again became very excited to have found a contraction. Her enthusiasm was contagious. "Wow. We found another one!" Missy said. They were very pleased and animated as they found each contraction. They found: *doesn't*, *didn't*, *can't*, *it's*, and *she'll*.

Haley's approach to writing down the contractions was slow and laborious. She wrote one letter, looked back at the book and struggled to find her place, wrote the next letter, then back to the book to find her place again and find the next letter. It was a slow and inefficient process. Missy finished long before Haley and tried to help; but Haley insisted on writing each word and page number herself.

After 20 minutes the reading groups switched. Haley, Missy, and another child began working with the instructional aide on their phonics workbooks. They were working on four letter, long vowel, silent *e* words. The words include pine, hose, mane, mole, vane, tube, cape, cane, wade, and cube. In the workbook were pictures with blank spaces for the children to fill in the words that corresponded to the pictures.

The instructional aide pronounced the words and the children wrote them down. The other two children moved ahead more quickly than Haley and the instructional aide focused the majority of her attention on Haley. When she provided the three phonemes of the word *hose* one by one, Haley wrote *h o s* and stopped. “You need to add an *e* at the end, right there,” she said, pointing to the worksheet, with no explanation as to why Haley needed to add an *e*. The instructional assistant was helping another child when Haley got to the word *wade*; Haley wrote *W D* under the picture. When the instructional aide looked back, she said, “No, you need a lower case *a*, erase that *D*.” The aide tried to erase for Haley, but Haley objected; she wanted to do it herself. Although they were working on words with a long vowel and silent *e*, I had not heard any mention of the *silent e* or *magic e* rule, vowels that say their names, or any other reference to the purpose of the activity.

Characteristics that Impact Literacy

When I interviewed Ms. Matthews in May of Haley’s second-grade year I asked how Haley was doing with some of the critical component skills of reading.

I have to say that I’ve been very surprised at her phonological skills, given both her speech and now her hearing loss. I’m surprised at how well she is able to identify sounds. Even though she may not be able to produce them she can often identify them and point to words that have whichever specific sound I’ve asked for at the beginning or at the end. Middle sounds are more difficult for her, but that is difficult for kids her age anyway. (P30, 35-40)

Ms. Matthews spoke of characteristics and behavior that she felt supported Haley’s progress:

If I'm using the overhead, she'll initiate, "I can't see." She's asserting herself that way very appropriately and asks to be moved. If she doesn't understand something she will ask for help. She'll ask for clarification. Of all of the students, she's the one I think that is most apt to ask for something if she's not getting it. (P30, 148-152)

Haley's mother reported that once Haley became aware of her hearing impairment, she began taking action to rectify situations when she wasn't able to hear:

If I'm talking to her in the hallway on the way after school, sometimes I forget and I'm on the wrong side of her, and she'll stop me in my tracks in the middle of everybody walking along in the hallway and say, "I can't hear you." And then she moves her body over to my other side and holds my other hand. She did that with my parents, when they were here, a couple of times. I heard her say "Nana, I can't hear you." So, she's really letting people know that. (P26, 414-420)

Haley's mother reported that Haley loved school and was very motivated to complete all of her homework assignments:

I think that one of her real strength areas is her ability to stay focused and tuned in. At night, she's motivated to do her homework every night.... I don't need to be standing with her to do it. She can do it. And she can do it with [her sister] running around and poking and prodding and [her father] can be on the phone with someone ... and she's still sticking with the writing or the math or whatever.... She's very diligent in that way. If it's worth starting for her then she wants to be able to finish it. (P30, 148-162)

Her mother also reported that Haley's visual tracking difficulties were neither effectively diagnosed nor well understood:

I guess a piece that we don't feel like we have a great handle on ... is her vision.... Her left eye drifts out on and off and it's something that we feel like we never have the greatest understanding of what's going on. [An HMO] is our insurance and every time they send us to an ophthalmologist, they say her vision is 20-20. Maybe for their computer her vision is 20-20, but perceptually what she's bringing in I'm not so sure about. (P30, 373-382)

The occupational therapist that works with her continually feels like her vision is really contributing to challenges for Haley. Visually, spatially, that's always been a challenge. Like placing puzzle pieces and other things. That's always been a challenge – not only a fine motor manipulative issue, but more like, how do I oriented that in space?... But that's a piece that I feel like we don't have the best handle on, but is contributing to some of her challenges and I wonder about it with reading. (P30, 385-400)

Literacy Progress in Second Grade

A few weeks before the end of her second-grade year I asked Ms. Matthews to evaluate Haley's reading progress in terms of the standard general-education curriculum. "Learning to read? I'm going to say probably the third or fourth month of first grade, so not quite halfway through first grade." Ms. Matthews reported that despite her phonological skills and motivation, Haley's reading progress that year had been slow. She attributed that, in part, to having less time to work on literacy:

She is making progress, but slow progress. Because Mr. Zima is here twice a week and he's been working with her more on written

language, it gives me at most three days a week to really work with her on her reading, so it takes a little bit longer. (P30, 9-12)

Both Mr. Zima and Ms. Matthews reported that Haley, like Angela, was making more progress with sight word reading than with decoding unfamiliar words. Ms. Matthews reported, “Once she knows the words, she does pretty well with taking information off the page” (P30, 29-30). Mr. Zima felt that Haley had not made much progress in developing decoding strategies:

I think she’s made progress in reading, increasing her sight word vocabulary... But if you’re talking about having decoding strategies for unfamiliar, tougher words, then no. (P28, 219-220)

Both Mr. Zima and Ms. Matthews reported progress in handwriting and in composition:

In fact her writing skills have made enormous gains this year. I’m amazed at her coordination and her ability to form letters. She’s really very motivated. Often times, she would rather do the writing herself than do it on the laptop. Mr. Zima has scanned a lot of that phonics workbook in there and at times she’s just as happy to write it herself.... She is tenacious about printing. (P37, 228-229)

The teacher showed me Haley’s notebook of written work. There was, in fact, a marked difference in legibility between the beginning and end of the year. However, her handwriting had a long way to go to approach typical second-grade printing. Ms. Matthews reported improvements in composition as well:

She’s having some difficulty with tense markers, but that’s getting better. Particularly if I look at work from the beginning of the year compared to now. They journal two or three times a week and I’ve

been rather pleased with her ability to take the information that she has in her head ... and formulate sentences and write them on the paper.... She is very motivated to find the spelling of words if she's not sure. (P30, 82-89)

Ms. Matthews shared with me her expectations for Haley's future literacy development.

I think she's got a lot of cognitive and intellectual capabilities and given her motivation and the support that she has at home as well as at school, I think she has a lot of potential. She's a wonderful child.... She's very motivated. She wants to learn. She's attentive. Those are all the qualities that anyone would ask for in any child, not to mention a child with special needs and some of the challenges that she has. They don't seem to be holding her back completely. They're slowing her down somewhat, but they're certainly not holding her back. (P30, 103-110)

CHAPTER SIX: PORTRAIT OF ALEXA

Of the three children in this study, Alexa had the most significant physical disabilities. She was unable to stand or walk unassisted. Her movements were hesitant and shaky. She had difficulty grasping objects, handling books, and turning individual pages. Her speech was difficult to understand and consisted primarily of vowels sounds. In the third year of this study, Alexa's life was further complicated when she was diagnosed with juvenile diabetes.

Alexa's start in life had been more difficult than her twin sister, Angela's; Alexa had spent her first 6 months in a hospital. Her physical disabilities limited her ability to communicate, even as an infant:

The big difference between [Alexa] and Angela really since the very beginning, was that Angela was so easy to read.... What I realized is that when a kid is young, what you are judging them on almost entirely is what they do motor-wise, including their face, their hands, their body, reaching – all of that. That's how they show you that they've got a mind. And Alexa was so much more limited in that. A lot of people ... who worked with her judged her as not very mentally there. Those who really knew better, who had dealt with physically disabled populations and could make those finer discriminations, saw it differently. (P25, 502-506)

Year One: Alexa in Preschool

When I first met Alexa, she was in a half-day, special-education preschool class at Valley View Elementary School. There were nine students in the class. In addition to the teacher, Ms. Reynolds, there was a full-time instructional aide, Ms. Barber, in the classroom. Alexa met with an occupational therapist and a speech

pathologist during the school day each week. She met with Mr. Zima twice a week at her home.

On my first visit to her classroom, Alexa arrived in her wheelchair with a big smile on her face; she was greeted enthusiastically by Ms. Reynolds and Ms. Barber. Ms. Barber helped her climb out of her wheelchair onto the floor. Once on the floor, she was able to move about independently by crawling. She made her way to the morning circle area and sat on the rug. While the children waited for everyone to arrive, they looked at books independently; this was their silent reading time. On the day of my first visit, Alexa had not selected a book to bring to the circle. The little girl sitting beside her was looking at a Dr. Seuss book. The child smiled at Alexa as she placed the book between them and the two children looked at the book together.

Ms. Reynolds read to the children every day, emphasizing language comprehension, vocabulary, story sequence, and predictions. I asked if Alexa enjoyed storybook reading.

Yes, she does.... She often likes the funny parts.... And I know that her parents read lots of stories with her. She can be quite delighted and she has that very delightful laugh. When she finds something that she likes, she really gets into it. And she really likes to help act out the stories. As you can tell, with her, it requires a lot of physical management for her to participate in those kinds of things. But she really does enjoy it and tries to the best of her ability. (P2, 322-338)

I asked Ms. Reynolds if reading or emergent reading skills were addressed in Alexa's Individualized Education Program (IEP).

I wouldn't say actual reading, more pre-reading skills.... I feel like it's important as a preschool teacher to give lots of opportunities, but not to sit and drill kids. To give lots of opportunities and be exposed to reading and letters and letter sounds and rhyming and all that, but not in the same way that you do in kindergarten and first grade – because they're in preschool. (P2, 45-51)

Alexa appeared to me to be a very engaged and competent member of the class. She volunteered answers to questions about the stories that were read, about colors, and the names of shapes. Her speech could often be understood when the context was known and a particular answer expected. During morning circle I saw her use her Pathfinder to lead the children in singing a weather song; the song had been programmed into her Pathfinder. Alexa selected the lines of the song one-by-one and the children sang along with the synthesized voice of the communication device: *Weather watcher, weather watcher, what do you see? Tell me what the weather's like; tell me please.*

During circle activities, Ms. Barber sat on a wheeled stool at the perimeter of the circle and rolled into position behind Alexa to provide support whenever an activity required her to stand or move about. One morning the children used stick-puppets to act out the story of *The Three Little Pigs*. Alexa was smoothly and seamlessly supported in these activities.

Communication and Cooperation

Alexa was an enthusiastic participant when she was engaged in an activity. However, Ms. Reynolds told me that Alexa was sometimes noncompliant with teacher-directed activities, “She’s a tricky one for getting her to do what you want

when you want her to do it” (P2, 292-293). Ms. Reynolds reported that Alexa had difficulty changing gears if she was focused on a favorite activity, and she required frequent breaks when she was fatigued. Alexa often insisted on doing things for herself, even when her teachers felt it was not the best choice.

There are times when she really wants to do everything that anyone else does. But because she’s slower it might take her five minutes or 10 minutes instead of two minutes. So, we try to pick and choose things that we want her to do by herself or that we want her to skip. An example being, after snack, for the longest time she insisted that she had to put her cup in the sink and then come to circle because everyone else put their cup away. But that takes her 5 minutes and in the meantime we can’t always hold up circle or wait. Getting her to accept that that’s one thing that maybe she could let go of – and that’s really hard for her. It’s going to be important for her at some point to pick and choose things, so that she’s not always the last one or she doesn’t miss five minutes. (P2, 461-474)

Ms. Reynolds also recognized Alexa’s assertiveness as a positive trait. “I’m glad that Alexa has her opinions and her likes and her tenaciousness. Even though I do battle against it sometimes, I know it’s going to serve her well in many ways” (P2, 753-756).

Alexa had certain topics that were of great interest to her, including anything to do with the characters and stories from the *Madeline*¹⁰ books and anything having to do with babies. One could usually gain her attention by addressing one of her favorite topics and Mr. Zima used this knowledge to secure her cooperation when he worked with her on communication.

As the communications specialist, Mr. Zima was sometimes called on to mediate when Alexa's behavior was challenging. He told me about an episode in which Alexa was protesting and acting up when it was time to go to occupational therapy (OT). The therapist wasn't sure what the difficulty was. Mr. Zima was able to determine that Alexa was trying to tell the therapist that she wanted to climb into her wheelchair, but the therapist was not listening or understanding and was lifting Alexa and putting her in her chair.

Literacy Progress and Expectation

Ms. Reynolds reported that Alexa was on target with her IEP goals. By the end of the school year, Alexa was able to point to all uppercase letters with 90% accuracy. She was also able to delete syllables from compound words. She had some difficulty identifying rhymes. Mr. Zima told me that he did an informal assessment of sound-letter correspondence while playing with refrigerator magnets. When he provided a phoneme and asked Alexa to identify the corresponding letter from a choice of two or three, she identified 19 of 26 correctly. I asked Ms. Reynolds for her long term expectation for Alexa with regard to literacy.

Well I guess it's hard to predict. I think that she'll learn to read. I don't know how fluently.... I worry about her distractibility issues and ability to focus on what the teacher wants her to do.... She's hard to figure out because there are so many factors that interfere with her showing what she knows. So, it's hard for me to figure out sometimes when she doesn't do something that I think she might be able to do, if it's because she doesn't know, because she's distracted, because it's too hard for her to put motor and word

retrieval together, if I haven't set it up particularly [well], if I haven't thought it through and eliminated as many factors as I can so that the motor fatigue doesn't set in.... Is it because she doesn't want to, she isn't able to – Because of all those factors it's very hard sometimes to tease out: does she really not know this? But, if she's motivated and you can eliminate those motor factors to the extent possible, and pace things – in a perfect world, I think she has the potential to be a reader. (P2, 358-396)

Year Two: At Laurel Lake School

In the second year of my study, Alexa moved from preschool to kindergarten. However, it was not to Ms. Grant's kindergarten class at Valley View, but to a kindergarten through second-grade special-education class for children with developmental disabilities at Laurel Lake Elementary School. Laurel Lake was an unusual school in that it had no classes for typically developing students; it housed the program for the district's most gifted elementary students as well as classes for students with physical and cognitive disabilities. Alexa's kindergarten had a very different focus and curriculum from the one Angela and Haley were exposed to the previous year. Her teacher, Ms. Anderson, told me that the class had been designed for children with developmental delays “who were working on social skills and a little bit of pre-academics” (P13, 466-467).

Ms. Anderson did not use a specific literacy curriculum, “I kind of make it up depending on what the kids' level is each year. If it's really low, then we're starting very very low.... this year we're kind of starting in the middle” (P13, 352-354). From my observations, the focus appeared to be letter-name recognition. When I first

visited in early May, *Q* was the letter of the week. The children colored a large worksheet with an upper and a lower case *Q* and pictures of a queen, quarter, quail, and question mark.

During my visits, I did not see Ms. Anderson read to the children, nor did I see any designated reading time when the children looked at books independently. I asked Ms. Anderson about this. She told me that earlier in the school year she had read to the children, but hadn't been doing that very much recently.

[Alexa] loved it; when we were doing circle time, we used to read a book every day and ... she would be the first one like right in front of me to listen to a story. (P13, 318-320)

When I observed circle time in Ms. Anderson's classroom, there was no book reading. Instead, there were many activity songs, similar to those at circle time in Ms. Parker's class. Some of the activities involved letter recognition. In one activity, bean-bags with letters on them were placed on the floor. The class sang a song and the children took turns picking up bean-bags that had specific letters on them and putting them in the basket. When the letter selected was *A*, the teacher asked, "Who has a name that starts with *A*?" "I do, and my sister!" was Alexa's response. (P17, 94-95)

On another occasion during circle time, Alexa was selected to put the date on the calendar. The numbers were large and attached to the wall calendar with Velcro. Alexa put the number 16 on the calendar upside down. The teacher said, "Is that how 16 looks?" Alexa laughed, removed the number, and with her slow, shaky movements placed it sideways and laughed. This time other children laughed, too.

Alexa then changed the number 16 to sideways in the opposite direction. After more laughter from Alexa, she finally put the 16 on the calendar right side up and grinned. Later, when another child put a letter on the board upside down, Alexa called out, “like me, like me, like me” (P19, 57-69).

Literacy Activities

Ms. Anderson reported that Alexa had trouble turning pages of books independently and rarely chose to look at books on her own in class. There were two computers with books on CD in the classroom for the children to use. During “choice time,” this was Alexa’s most frequently chosen activity:

And that’s what she does during choice time.... She specifically goes over to the computer. We have Arthur books. We have Blues Clues ABCs, the Cat in the Hat, lots of Dr. Seuss books ... on the computer. That’s what she always chooses during choice time. (P13, 327-330)

The classroom computers also had beginning literacy software. I watched one day as an instructional aide worked with Alexa on an activity for identifying words that started with a specific letter. Alexa made a few incorrect selections, but it was difficult to know if they were intended choices or the result of the difficulty of the motor task. At other times she seemed to deliberately choose the wrong answer and laugh about it. It was hard to know.

At Laurel Lake School, some of the students, including Alexa, received reading instruction using Distar,¹¹ a direct instruction reading program. Ms. Wood was an instructional aide who had been teaching reading using the Distar curriculum

for many years. Alexa met with Ms. Wood for 20 minutes, twice a week. Sometimes Alexa met individually with Ms. Woods, but more often they met with one or two other children. They worked on pre-reading skills, letter-sound correspondence, and phonological and phonemic awareness.

Because Distar was a scripted program that required the child to pronounce phonemes and repeat sounds, Ms. Wood had to modify and adapt the instruction to meet Alexa's needs. I asked Ms. Wood if there were any specific challenges in working with Alexa.

Well I think the one thing that I have to really watch with her in the reading is I definitely have to make it successful.... She doesn't say anything, but I can see it in her face that she's feeling disappointed that she wasn't able to do that. So that's why we take such slow even steps. And sometimes what I'll do, I'll pre-correct. If it's something totally new ... I'll tell her what it is. Then we go back through it again. (P12, 231-237)

Ms. Woods reported that Alexa knew the sound-letter correspondence for most letters, was very motivated to learn to read, and worked hard. Alexa did not demonstrate challenging behaviors when she was working with Ms. Woods. Ms. Anderson reported that Alexa was always eager to leave the class to go work with Ms. Wood.

Alexa's Inclusion Experience

Alexa's parents wanted her to be included with typically developing peers for part of her school day. Because of the unusual makeup of the school, there were no general-education kindergarten or first-grade classes, so Alexa spent 40 minutes each

day in a combined first- and second-grade class for gifted children. She was usually in the inclusion class for language arts lessons. This was another activity in which Alexa was happy to participate, “She goes next door [to the inclusion class] with no problem and wants to stay in there all the time” (P13,492-493). The following observations are from a classroom visit that I made in May (P19, 3-43).

One day when I visited, Ms. Evans, the teacher of Alexa’s inclusion class, was reading aloud to the class from *Caddie Woodlawn*,¹² a chapter book about a child living during the pioneer days in rural Wisconsin. The children sat on a rug on the floor, each with a copy of the book to follow along as Ms. Evans read. When Alexa arrived, she climbed out of her wheelchair and crawled over to sit on the rug with the other children. The child sitting beside Alexa shared her book. The teacher asked, “What are some clues about what might happen next?” Alexa appeared very attentive to the other children’s responses.

Ms. Evans asked, “How might you describe Caddie at this point in the story?” “Courageous” suggested a child. “Courageous, what a wonderful word!” exclaimed Ms. Evans. Caring, interesting, brave, and adventurous were some of the other suggestions from students. When Ms. Evans read the word *inconsolable* in the story, she wrote it on the board. The class discussed the meaning of the word. “How might you console a friend?” she asked.

Ms. Evans read the title of the next chapter: *Ambassador to the Enemy*. The teacher wrote *ambassador* on the board and discussed with the class what it meant to be an ambassador. “Who is Caddie the ambassador for?” asked the teacher. Alexa

raised her hand, was called on and said, “The Indians!” “Great!” said the teacher, “She is going to visit the Indians, and who is she representing?” “The pioneers,” contributed another child. As the teacher resumed reading, the child sharing a book with Alexa pointed to where they were on the page. Alexa began to point to various places on the page, too, apparently randomly. The other child gently moved Alexa’s hand away when it covered the text being read.

Mr. Zima sometimes accompanied Alexa to Ms. Evans class. He told me of one occasion when he helped Alexa complete an assignment for the class that she hadn’t had time to finish while in Ms. Evans class. The finished assignment was one complete sentence that she had written using the Pathfinder, with Mr. Zima’s support. When she completed the assignment, Alexa wanted very much to hand it in to Ms. Evans:

I gave her a copy to take home and a copy to hand in. And she was so gung-ho about it that we went to the classroom where she’s included and looked in and they were busy ... so we didn’t want to interrupt... I asked her, “Can I turn this in for you later? We need to get you back to your class.” And she said “Uh uh.” She wanted to wait. So we waited until the end of the day. She wanted to be the one to submit her work. (P15, 162-168)

Progress and Expectations

The three educators I interviewed during Alexa’s kindergarten year were not in full agreement about her progress or her potential. Ms. Anderson told me that Alexa could identify most upper case letters, but “lowercase is still pretty hard for her” (P13, 21). She also told me that prior to spring break, Alexa had been able to

identify some phonemes, but when she returned after break, she seemed to have forgotten them all:

Now we're working on the sounds of the letters.... Mr. Zima ... doesn't really agree with me She recognized about 6 or 7 of those before spring break and then when she came back from spring break ... I don't know if she just didn't remember or if she was kind of – didn't want to do it. You know. Cause she does get stubborn and crosses her arms and doesn't want to do it. So we're kind of starting all over again. (P13, 23-47)

When I asked about rhyming and other phonological awareness tasks, Ms. Anderson expressed the view that rhyming was too difficult for the students in her class, including Alexa:

Mr. Zima ... started doing the rhyming and it was just a huge concept for them.... We tried and it was just too big of a concept right now for them. (P13, 136-137)

On the other hand, Mr. Zima reported that Alexa had developed skills in identifying whether or not words rhymed, although she was not able to produce a rhyme on request:

During the sessions where we really were targeting it, for several weeks in a row, you could see an increase in awareness and identification of words that rhyme vs. words that didn't rhyme.... And I'd kind of walk them through tons and tons of words.... We brought lots of explicit awareness to that. So her identification skills increased, but in terms of production, I haven't seen it. (P15,64-72)

Ms. Woods shared Mr. Zima's assessment that Alexa was able to identify, but not produce rhymes:

She can hear them. Yes. The ones that I've done with her she can identify. She does good on listening.... She wouldn't be able to verbally tell me ... but she can say yes or no whether it rhymes. And rhyming is also one of the things that we do a lot. (P12, 253-257)

Ms. Anderson reported that Alexa could identify the written names of all the children in her class, but there had been no effort in the class to teach word reading to Alexa or any of the children. Ms. Anderson told me that she was unsure of what to expect from Alexa:

Well, long term I'd like to see her actually being able to read simple words and then I don't know from then on ... I don't know yet if she's going to be a sight-word reader or if she's actually going to be able sound out the words, right at this point. Still she's a kindergartener so I still, I just don't know. I'm hoping she would be one of the ones that I would say would be able to succeed with reading compared to some of the other kids in my classroom. But I don't know. (P13, 195-201)

Mr. Zima's goals and expectations were more clear:

My goals would be to have her at the same level of literacy achievement as her typically developing peers. And if not, then whatever the developmental continuum holds, to follow the developmental continuum as closely as possible.... I think everything's going to take more time. (P15, 204-207)

Ms. Woods told me, "I feel like she has a lot of potential. And I think if she gets the right training and gets in the right position at the right time she's going to learn [to read]" (P12, 392-394).

Year Three: Alexa at Birch Bay School

During the third year of the study, Alexa and Angela were in the same class, Ms. Parker's class at Birch Bay Elementary School. Although there was no independent silent-reading time in the classroom, Ms. Parker often read to the children. During reading activities Ms. Parker focused on vocabulary and narrative elements and asked the children to predict what might happen next. Alexa seemed very engaged and attentive during storybook reading. During one of my class observations, Ms. Parker read *Giggle, Giggle, Quack*,¹³ a picture book with a running joke that was implied by the pictures, but unstated. In the story, the farmer went on vacation and left written instructions for his brother about how to take care of the animals while he was away. He also warned his brother to watch out for the duck, who was a troublemaker. When the farmer's brother read the instructions, he found that they included serving the animals pizza for dinner and inviting them inside the house for movie night. Of the three children in the class, it was Alexa who was laughing the most and who seemed to have gotten the joke. When the teacher asked, "Who do you think had written those notes?" It was Alexa who called out, "Duck!" (P35, 50).

Like Angela, Alexa had a workstation with a laptop computer that she used to complete both math and literacy activities. This year Alexa also had an oversized keyboard to facilitate her typing. The literacy software that she used in class was focused on letter-sound correspondence and basic phonics activities with CVC words. She often worked with support from Ms. Clark, the instructional assistant.

Ms. Parker reported that Alexa sometimes could complete phonics activities on the computer that she did not always demonstrate in other settings:

She's a tough one to assess. I am finding ... she's got the letter-sound correspondence in some situations and in some settings she doesn't. And I'm not sure if she's not generalizing it or if it's just refusal.... It could be that she's memorized the program or it could be that she learned it. But if she learned it, she should be able to reproduce it in other settings and I don't necessarily see that. (P29, 593-605)

Inclusion

Alexa spent about an hour every day included in a general-education classroom. However, unlike Angela who was included in a second-grade class, Alexa was included in a kindergarten class. Factors of class size, scheduling, convenience, and the willingness of general-education teachers to accept a special-education student appeared to be the dominant factors in the inclusion placement decisions.

I accompanied Alexa to her inclusion kindergarten on a few occasions. It was a large class and the students worked as a group on sound-letter correspondence and other early literacy tasks. There was an emphasis on learning to write, both to form the letters correctly and to practice writing common words such as the names of colors. Alexa used her laptop for writing and drawing activities. The approach to reading instruction was implicit phonics rather than the explicit, direct instruction that I had observed in Ms. Grant's class. During one visit when they were working on the letter *G*, the teacher had the children contribute all the words they could think

of that started with the letter. The teacher wrote the words on the board. Alexa made no contributions. Another day when I visited, the class was working on the *ch* sound and the teacher taught them a poem about Chauncey Chipmunk.

In addition to the morning language arts inclusion, Alexa sometimes spent time in the general-education kindergarten classroom during afternoon free choice activities. However, her participation in afternoon inclusion was closely regulated by Ms. Parker, based on Alexa's behavior. Alexa's noncompliant behavior was a challenge to Ms. Parker and she attempted to control it by a system of consequences. Early in the school year, she had sent Alexa to the principal's office on one occasion and another time had Alexa copy sentences off the board as punishment for non-compliant behavior. It was interesting to note that when Alexa copied the sentences, she included no white space. She typed: "Iwillnotsaynotomyteacher." Ms. Parker viewed Alexa's noncompliant behavior as arbitrary and as a way to assert control:

It is everything that I've learned and experienced about people with severe disabilities. There are things that they can control and they're limited because of those severe physical disabilities, so where they have the ability to control, they sometimes step up and take control, even when it appears to have no – even when nothing appears to have sparked it. It's just "I'm going to control the situation." And we've had quite a few of those instances with Alexa where she just flat out says "no"... That's not acceptable and we're just going to have to deal with it. (P29, 575-582)

Ms. Parker reported that in addition to refusing to work, Alexa also had tantrums, "We've probably had a half dozen kicking, screaming, refusals ... and

they've been primarily around physical activities" (P29, 668-676). Over the course of the school year, Ms. Parker tried a variety of strategies for controlling Alexa's behavior.

One thing that has worked very, very well for this is to offer her choice [in the general-education kindergarten]. The two days of the week that we have PE, which are difficult times for her – and one of those days she has OT with PE, which makes it even worse, she hates it – I've been offering choice time. She gets choice in the kindergarten classroom at the end of the day when she has participated in PE without refusing and protesting.... The choice inclusion is a motivator for her. (P29, 682-691)

I asked Ms. Parker what Alexa did during free choice inclusion activities. "She plays with the other kids.... She goes down there and plays" (P29, 695-698).

Literacy Activities and Development

As a volunteer in the classroom, I had the opportunity to work with Alexa one-on-one and I came to better understand the challenges that she faced as well as the strengths and limitations of her literacy abilities. I found that Alexa did a good job of sorting words by starting sounds and matching words that rhymed. For example, when I provided pictures of cat, hat, pen, hen, bug, and rug, and pronounced each of the words, she was able to sort them into rhyming pairs. However, one day she insisted that pen and bun rhymed, and nothing I said could dissuade her from this position.

For most consonants, Alexa was able to point to the appropriate letter when provided with a phoneme, but as far as I could tell, she did not know how to use this

knowledge to read or spell words. In the fall, when Mr. Zima had assessed Angela's spelling, he also tried to assess Alexa's spelling knowledge. However, he gave up when Alexa typed "hhh" for fan and "kkkk" for pet. These results suggested that she either had no understanding of how to spell words independently or she had chosen not to cooperate in the assessment.

Although Alexa often spontaneously identified the names of family members and classmates when she saw them in print, she could not or would not identify words in books. She enjoyed the book *Green Eggs and Ham*.¹⁴ One autumn day, I pointed to the word *I* in the text of the book and asked her what word it was, she replied, "I am Sam. Sam I am." Although she could identify the letter *I* in isolation, when I pointed to the word *I* in the book, she began reciting the book.

Alexa could not manipulate cards or papers reliably, so when working with Alexa, we often put letters or pictures on pieces of foam core. They were lightweight and had enough thickness that she could pick them up and handle them. I printed the words *I am Sam*, each on a separate piece of foam core. I arranged the words into the sentence, *I am Sam* and pointed to each word as I read it. But even after I had pointed and read the words a few times, when I pointed to the word *Sam* and asked her what word it was, she responded, "I am Sam." I printed her name on a foam core card and asked her what it said. "Alexa!" We formed the sentence, "I am Alexa" and touched each word as we spoke it. Then we did the same with, "I am Sam." After this activity, when I pointed to *Sam* and asked what the word was, she said "Sam." The next time I returned the class, I asked her to make the sentence, "I am Alexa."

She created, “I Alexa.” I told her we were missing a word, “What word are we missing?” “I don’t know,” she said. I showed her the word *am* and asked her to add the word to make *I am Alexa*. She added it at the end, *I Alexa am*. After we talked about left-to-right word order, fixed the sentence, and read it a few times, I prompted her to put a period at the end of her sentence. She placed the period at the beginning, before the *I*. She seemed to be engaged in the task and I do not think her errors were deliberate or attempts at humor. It seemed to me that she really did not understand the significance of word order or where the beginning or end of the sentence was found. But with Alexa, it was hard to be sure.

Intervention at Home

In the second half of the school year, Alexa’s mother initiated *Sound Partners* instruction with both of her daughters. The curriculum could not be followed as written because the children could not articulate many of the letter sounds, but the lessons were followed in sequence with adaptations made as necessary. With this instruction from her mother, Alexa began to learn to read CVC words. By the end of the school year she was able to read several of the *Bob Books*¹⁵ and *Clifford Phonics Fun* books. However, it remained a challenge to gain her cooperation and keep her engaged. When I read with her, she sometimes refused to participate. I found that if I began reading very slowly, pointing to each word, and then stopped at a word that she knew well she would often, but not always, take up the reading where I had left off. When she read, she was quite deliberate and focused on each word.

Her reading development seemed unusual to me in some ways. For example, often when I turned a page, rather than beginning to read from the top left, she would scan the page looking for occurrences of a particular word and point to and read that word wherever it appeared on the page. It took persuasion to get her to start in the beginning and proceed through the page, and she sometimes refused and could not be persuaded.

Writing with the Pathfinder

Alexa continued to work with Mr. Zima on communication and the use of her Pathfinder. They often wrote stories together. Mr. Zima was usually successful at getting Alexa's cooperation by allowing her a great deal of input on what they would work on and by giving her breaks when she asked for them or when she seemed distracted or fatigued. Alexa wrote the following story using Pathfinder icons with support from Mr. Zima:

This is a story about baby Angela. She's not born yet. They go to the hospital. The doctor goes bump bump bump on the mommy's tummy. The doctor takes the baby out. They go home. The highchair goes in the kitchen and the crib goes in the living room. (P42)

Mr. Zima told me that when Alexa dictated the story to him, she made errors in verb-noun agreement that they corrected as they selected the icons. For example, Alexa had dictated: "she not born," "the doctor take," "the highchair go," and "the crib go."

I was sometimes surprised by Alexa's strengths. When she began to learn the short vowel sounds, she learned them quickly and remembered them very well.

You ask her which letter makes whatever sound and she's got it. I was working with Jason and he was struggling thinking about what letter. I think the hardest short vowel is /e/ because it sounds like A and it just throws your mind for a loop. So I said, hey Alexa can you help us out? And she said "E." (Zima, P28, 494-497)

I found that Alexa was also very adept at blending phonemes into words, when the phonemes were presented by an adult. Both Alexa's mother and Mr. Zima commented on this ability as well:

I gave her the sounds of the words and I asked her to say them. I tried about 10 of them. And she got 9 or 10 of them. She was so right on.... I would just go, what word is this? /d/ /e/ /s/ /k/? And she'd go [dysarthric pronunciation of desk]. For most of them I wanted to confirm that she knew what I was talking about, so I'd say "what do you do with it?" And she'd say things like "sit at it." Or "eat it" or "write it," which let me know that she'd got it. (P28, 473-483)

Teacher's Assessment

When I talked with her classroom teacher, Ms. Parker, about Alexa's progress that year, Ms. Parker told me that she was pleased with the growth of Alexa's physical abilities and self-help skills:

Overall, Alexa has just grown enormously and part of the reason why I didn't step back with all of that protesting was because we could see some growth happening physically.... So even if she didn't like it, she was making a huge step up and she's walking now in the walker, and she's going to the bathroom now completely independently, and on the ball in the morning she's balancing herself and righting herself when she starts to fall. (P29, 706-712)

Although Ms. Parker was very pleased with Alexa's growth in physical skills, my focus in the study was literacy. Ms. Parker provided the following assessment of Alexa's growth in academics that year:

Academically, I think we haven't progressed as much as we would have if we'd done a first-grade inclusion. I really think it wasn't the best choice to do a kindergarten inclusion – to do the kindergarten inclusion instead of first grade – because she didn't get exposed to any new academic information, really. She was getting a repeat of what she's had. (P29, 639-643)

Ms. Parker relied on the inclusion class, Alexa's mother, and Mr. Zima to provide the majority of Alexa's literacy instruction.

She's been getting great writing instruction from Mr. Zima.... I tend to do less writing with her because Mr. Zima does so much of that with her when he's here. I kind of figure he covers it very well (Parker, P29, 832-834).

I asked how often Mr. Zima worked with Alexa. She replied, "Just Wednesday afternoons." (Parker, P29, 838). Mr. Zima reported that Alexa had developed graphophonemic knowledge, despite her inability to articulate many consonant sounds:

She seems to have a strong inner-speech system.... Even if she can't produce the word and articulate the phoneme, she seems to have the sound-letter correspondence, despite that inability to produce it. So that's a very positive thing. (P14, 444-447)

At the end of the school year, Ms. Parker wrote the following assessment of Alexa's reading progress in her IEP.

According to the Brigance inventory of early development, Alexa is reading at the pre-primer level. She was able to read 11 out of 40 words at the pre-primer/primer level, a 20% success rate [sic]. She is reading 10 of the first 25 instant words from “the reading teachers book of lists,” a 40% success rate. She has a total repertoire of 26 sight words (a, and, baby, be, big, box, can, cat, dad, did, dog, for, go, I, in, into, like, me, Mom, not, on, see, the, to, up, and you). Alexa is orally reading 8 to 9 words per minute at the pre-primer level with assistance (i.e., the teacher reads words not attempted after a pause for Alexa to read them). Alexa currently does not attempt to read words she does not know. She is skilled at reading using context clues and can read by memory stories read to her. She is able to answer reading comprehension questions at the primer level about texts read to her.

CHAPTER SEVEN: THE STAGES AND PROCESSES OF LEARNING TO READ

Stages of Literacy Development

Angela and Haley

Despite the many differences between Angela and Haley, their reading progress was remarkably parallel. If we examine the children's literacy development from the perspective of Ehri's stage model, we find that both children were in the partial-alphabetic stage in kindergarten, when I first met them. They had attained alphabetic insight; they recognized that there is information about the phonology of a word embedded in the letters that form the word. They knew, for example, that changing the initial letter would change the word cat into rat or pat. They were able to use their graphophonemic knowledge to distinguish between the printed words cat, rat, and pat. They made connections between the letters and the sounds in printed and spoken words. They used letters as phonetic cues. They had learned to read some sight words, but typical of children in the partial-alphabetic stage, they were not able to independently sound out unfamiliar words.

Although both Angela and Haley made some progress in reading over the following two years, by the end of their second grade year, neither child had completed the transition into Ehri's next stage, full-alphabetic. In the full-alphabetic stage, readers use all available orthographic information to decode words; they can segment words into phonemes and can decode unfamiliar words. It is at this stage that children achieve Share's (1999) sine qua non of reading acquisition: self-teaching of new words. Neither Angela nor Haley achieved that benchmark by the

end of the study; the children remained in transition between the two stages. They had developed strong graphophonemic knowledge and had learned many new sight words; however, they were still not able to decode unfamiliar words, the hallmark of the full-alphabetic stage.

Alexa

According to reports from her teachers and my own observations, Alexa was a difficult child to assess – which limits my confidence in my evaluation of her literacy development. Given that caveat, my perception was that Alexa did not achieve alphabetic insight or master the concept of word until the third year of this study. It wasn't until her mother began providing decoding instruction using the Sound Partners curriculum that Alexa moved into the partial-alphabetic stage. Although Alexa knew the letters of the alphabet and the phonemes associated with most letters, I did not see evidence that she understood how that knowledge related to the reading of words. She was able to identify the printed forms of the names of classmates and family members, but she demonstrated no evidence that she knew any strategies for decoding words. Alexa did not appear to know that her graphophonemic knowledge was the key to unlocking the meaning of print.

Furthermore, there was evidence that she lacked an understanding of word boundaries and the concept of word: Alexa left out white space when copying sentences and she associated several words of speech with a single printed word in the book, *Green Eggs and Ham*. When Alexa was at Laurel Lake School and the child with whom she was sharing a book pointed to the words being read by the

teacher, Alexa began to point to the page, too, apparently randomly. Her behavior suggested that she may not have understood why the child was pointing to the words. At the time that seemed improbable to me. Yet the following year, as I spent more time with Alexa and read with her, I came to believe that this was the case. The evidence suggests that until the third year of the study, when her mother began providing decoding instruction, Alexa did not recognize that there was a systematic relationship between orthography and phonology.

Graphophonemic Knowledge

Although their reading was delayed, all three children learned grapheme-phoneme relationships for phonemes that they could not articulate as well as for those that they could. For example, none of the children could pronounce the consonants, *r*, *s*, and *l*, yet all three could identify words that started with those letters and could reliably point to the corresponding letter when an adult articulated the phoneme. Alexa and Haley were able to produce fewer consonant sounds than Angela; however, for consonants that they could articulate, all three children reliably produced the sound when shown the letter.

In the partial-alphabetic stage, children typically have incomplete graphophonemic knowledge and may associate sounds primarily with letter names. Both Angela and Haley demonstrated greater graphophonemic knowledge than is typical for children at that stage of reading development. Alexa also had graphophonemic knowledge that was more highly developed than one would expect, given her limited progress in reading. In this respect, the children's passage through

the stages of literacy acquisition was atypical. Both mothers commented that their daughters had better phonemic awareness than the children of friends and family who were older:

I have a nephew who's 10 and he's experiencing some challenges in his reading and my sister says he still doesn't really know all of the phonemes in an automatic kind of way. And Haley had that when she was five or six (Haley's Mother, P26, 121-124).

All three children in this study experienced difficulties learning to read, but the problem did not seem to be alphabetic knowledge or phonemic awareness, two factors considered to be primary predictors of reading outcomes.

Scaffolding

In reading and spelling, the children relied heavily on support from adults. When an adult provided the phoneme, all three children were quite accurate at identifying the corresponding letter. When an adult segmented and pronounced the phonemes of a word, the children were able to use their graphophonemic knowledge to spell words. Haley's success at spelling the word *upset* with Mr. Zima's help when she was in kindergarten is an example. Yet, two years later when she tried to spell *wade* independently, she wrote WD.

I watched one day as Angela was writing with support from Mr. Zima. She wanted to write the word *really*. Mr. Zima asked, "What sound does it start with?" Angela pronounced the word; however, her pronunciation of the word *really* was wee-ye. When Angela attempted to break the word into phonemes, she pronounced the initial phoneme, /w/. Mr. Zima then pronounced the word and the initial

phoneme, /r/, and Angela selected the letter R on the keyboard. Just as it is more difficult for a communication partner to understand the word *really* when it is pronounced wee-ye, it may have been more difficult for Angela to make the letter-sound connections when she was listening to her own mispronunciation of the phoneme.

In blending and reading, the children were also more successful when they received scaffolding from an adult. When the children were struggling to read an unknown word, if the adult pronounced each of the phonemes, the children were often successful at blending and identifying the word. Alexa, who had made the least reading progress of the three, was remarkably skilled at blending phonemes when they were pronounced for her by an adult:

She's uncanny. I just can't believe it sometimes. I sometimes think we'll have to make a few more passes, but she's already got it. And Angela is also pretty good at that (Alexa's mother, P25, 737-739).

When the individual phonemes had been spoken by an adult, all three children were able to identify words by blending the sounds silently, in working memory. However, they were apparently unable to perform the complete task; they were not able to retrieve the sounds and blend them in working memory, silently. These three children were faced with challenges in learning to read that were different from those of children with typically developing speech. For a child who knows the phonemes associated with letters and who can articulate those sounds, producing phonemes aloud when decoding a word is always an option. For Angela, Alexa, and Haley, it was not.

Encountering Difficulty

How did the children make progress through the stages of literacy development and where did they encounter difficulty? Angela, Alexa, and Haley developed phonemic awareness and graphophonemic knowledge. Yet, they had difficulty putting that awareness and knowledge into practice in the tasks of decoding and spelling. There were aspects of their literacy development that were unusual. For example, their graphophonemic knowledge exceeded what would be expected based on their reading abilities. Or, stated another way, their reading skills lagged behind what would typically be expected based on their level of graphophonemic knowledge. Their literacy progress was slow and somewhat unusual, but not fundamentally different from that of many children who struggle with learning to read. Despite their atypical experiences with speech, language, and communication, the children in this study became stalled in their progress at a stage where many struggling readers falter. They had not achieved Share's *sine qua non*; they were not able to reliably decode new words when they encountered them in print. They relied on adults to help them read unfamiliar words and they required repeated encounters and repeated help with the new words in order to fix them in memory.

Ms. Grant reported that Angela and Haley stalled in their reading progress when instruction moved beyond CVC words into CCVC words with consonant blends. CVC words may have been easier for the children for multiple reasons. Whereas stringing multiple phonemes together in speech was difficult for the

children, they were able to produce short vowel sounds and some consonant sounds in isolation. This may have allowed the children to sound out some CVC words or produce approximations of the individual phonemes so that they could listen to their own speech production to blend and identify some words. Also, in kindergarten, there was a limited repertoire of CVC words that the children were learning, and they may have memorized the words through repetition, without complete phonemic analysis. Mr. Zima suggested that blends presented particular difficulties for the children because they contained sibilant and liquid consonants, s, r, and l that the students could not produce, even in isolation. Ms. Grant felt that Haley and Angela did not hear the blends and she developed games and strategies to increase their awareness of consonant blends, which helped, but did not resolve the difficulty.

Alexa made considerably less progress in learning to read than Angela and Haley, but she also received far less instruction. There is no way to know if Alexa would have matched or exceeded Angela and Haley's progress, had she received appropriate instruction.

CHAPTER EIGHT: CONTEXT OF HOME AND FAMILY

The children's parents had filled out questionnaires regarding the children's home literacy experiences and behaviors. Both families reported that the children enjoyed storybook reading and were read to regularly at home. I visited the children's homes and interviewed their mothers in the third year of this study. My visits to the children's homes supplemented and corroborated much of what the questionnaires and the teachers had told me about the children's home literacy experiences. Alexa, Angela, and Haley came from homes that provided strong exposure to literacy experiences. The children's homes were filled with books, magazines, and newspapers. Family members read for information and for pleasure regularly. In both families, the children saw their parents use computers for writing and e-mail and the children had access to computers at home, as well.

The children's teachers reported that both sets of parents were concerned about their children's literacy development, were involved in the children's education, and provided home support for the children's work at school.

[Haley's] got a supportive family. (Matthews, P30, 211)

[Haley] will often take home books that we're reading – level appropriate books – that she wants to read at home with her mom.
(P30, 20-21)

I think that [Angela and Alexa] get so much exposure [to books] at home that it makes my job easier ... Therein lies the difference between these girls and other students that I've worked with whose parents ... don't have money to go buy supplemental materials and they don't have time because everybody's working. These girls are

getting a lot of exposure to books and a lot of exposure to phonics instruction and a lot of exposure to literacy instruction at home. (Parker, P29, 499-507)

Storybook Reading

Angela and Alexa

Angela and Alexa's mother indicated on the questionnaire that she started to read to the children when they were between 12 and 18 months of age. However, when I interviewed her, she told me that she really wasn't certain about when she started reading to them; she reported that much of that time period had become a blur and she found it difficult to recall details of early reading activities. Angela and Alexa were born prematurely and both required medical intervention in their first days of life. Their medical needs and physical development were top priorities for the family in their early years. In addition, the twins had an older brother, Nicholas, who was a toddler at the time they were born. With the birth of Alexa and Angela, their parents had three children less than three years of age, two of whom had significant disabilities. Their mother reported that Nicholas was read to earlier and more consistently than Angela and Alexa:

You know, I don't feel like we were doing as much with [Angela and Alexa] in that area. Nicholas, of course, was the only child and the first child, but he ... just got so much more.... It was also just harder to know what was meaningful to [Angela and Alexa] at earlier stages. (Mother, P25, 336-343)

When the twins' medical situation stabilized, physical development and communication issues became central. "For the girls, it seemed to me that language

was much more fundamental and on such uncertain ground that I really have felt that that was my primary interest with them for a long long time” (Alexa & Angela’s mother, P25, 367-369).

When their parents began to focus attention on books and reading with the girls, other challenges arose:

Parent. There was a period when it was very hard to read to them.

Interviewer. Because?

Parent. Because they couldn’t agree.

Interviewer. On what to read?

Parent. Yes. Because Alexa – it was bad for Angela, because Angela was open to being read anything, and Alexa was insisting on *Madeline*. You know, this probably went on for more than a year. It was very difficult.

Interviewer. That was all she wanted to be read – was *Madeline*?

Parent. Yes. And Angela was bored with that and she was ready to move on. *Madeline* had never been her thing anyway. She was just at a different stage where she was more universally curious. So, that was hard. (P25, 318-335)

Despite their mother’s concerns that the twins may have been shortchanged in comparison with their brother, all of the educators I spoke with perceived that Angela and Alexa had strong literacy support at home. By the time this study began, the challenges to reading had been resolved and storybook reading had become a regular activity in their home. Mr. Zima reported that when he went to the children’s home, there were piles of children’s books all around the house; the children were

clearly familiar with the conventions of storybook reading and enjoyed having books read to them. That was my experience as well.

Haley

Storybook reading came easier at Haley's home. Haley was the first child in her family and was born full term. Haley's mother reported that she began reading to Haley before she was a year-old and had read to her at least once a day ever since. Haley had a sister, Katie, who was born when Haley was two years old. Haley's mother's love of children's literature and enjoyment of reading to her children was clear to me when I interviewed her.

Interviewer: Do you read to Haley most nights before she goes to bed?

Parent: Oh yes. And that's always been an activity that she's loved. We always [read] at night. We read two stories before bed every night.... They can pick one book each or we read one book chapter.

Interviewer: What book are you reading now?

Parent: We just finished the *BFG*, the *Big Friendly Giant* by Roald Dahl.¹⁶ It was a fine book for them. It was sort of new territory because it's a little bit scary. The Big Friendly Giant is a great guy, but there are some scary giants that eat children. But it's an imaginative story – I have relatively concrete kids and this one was really kind of wonderful and imaginative. The BFG blows dreams into children's rooms at night.... Anyway, he and the little girl end up saving, essentially, the world from these other giants.... We've read *Charlotte's Web* and they like things about animals. But then we've also read things like *Betsy and Tacy* – which are just old-fashioned books about these two little 5-year-old girls – just a very basic simple sort of story. Then we've read a little bit of the *Magic*

Tree House books, are you familiar with them?... Those are nice in that there's 36 of them and it's a brother and sister combination. It's a 7- or 8-year-old brother and a 5-year-old sister and it's all about this magic tree house and when they go into the tree house and they find a book, whatever they open the book to – like Egyptian pyramids – the tree house begins to spin and the next thing you know, they are there.... I feel like with chapter books, it's just recently that they're satisfied to look at an occasional picture and then lie back and be listening and really stay with it, which feels different from say a year ago. (P26, 28-76)

The transcript of my interview with Haley's mother is filled with passages that attest to her love of books and literature and her great pleasure in sharing this love with her daughters.

Reading Instruction at Home

Angela and Alexa

During the third year of my study, Angela and Alexa's mother had taken on the task of providing reading instruction to her daughters to supplement what they were receiving at school and to try to help them catch up with their grade-level peers. She reported that she appreciated that the Sound Partners curriculum provided step-by-step instructions for the tutor. When I interviewed Alexa and Angela's mother, she discussed her previous hesitance to try to teach the girls to read herself:

I'm a person who doesn't want to just do stuff without understanding what I'm doing or feeling a thoughtful process behind it. I just never felt like I could [teach them to read] myself.... Maybe I mystified it more than I should have.... I kind of felt like there's more to know than I know to do this in an effective way. Maybe if

they had been super precocious and soaked it right up, it wouldn't have been a problem. But, they weren't. (P25, 372-379)

The twins' mother followed the Sound Partners curriculum and worked with each of the children for a half hour, several times a week. "I don't feel like we're doing exceedingly well, but I feel like we are making progress" (P25, 868-869).

Haley

Haley's mother worked with Haley on her reading most days, but did not use any specific curriculum. She provided support as Haley read aloud:

[Haley] likes to read with you; the way we usually do it is I read a sentence and then she reads a sentence. Or I do a page and then she does a page. (P26, 21-22)

We get home by four o'clock and ... she's also been bringing home these nice early readers from Ms. Matthews's class. Those, for her, seem more charged with interest.... So she'll often pull that out of her backpack and that's one of the first things she wants to do with me when we get home. On a regular basis, we probably read something in the afternoon and that's probably more when we do the sharing back and forth reading. (P26, 29-40)

Sometimes it feels like everything we do is sort of therapeutic, but I try for it not to be.... At night, at bedtime, I'm not reading for any teaching purposes. Although, what we'll often do is that I'll say, "Daddy wasn't here for last night's reading, can you guys tell us a little bit about what happened last night." So I'm trying there to just elicit how much content they're getting, which is exciting for me, because that's the kind of thing that Haley used to flatly say, "I don't know, I don't remember." You know, really enjoying it while it happens, but not necessarily following the story line. And so it

was wonderful to have her do that. [Her sister] is always ready with what has happened and she's got a lot of detail. Haley doesn't have all the detail, but she's following the story line and can talk about the story line. (P26, 272-288)

Home Contrasts

Like Ms. Matthews, Haley's mother reported that Haley was very motivated to write with a pen and pencil; that was something that Haley often did on her own at home. But she also enjoyed writing on the computer:

She likes to send e-mail to my parents or her other grandparents and she likes sometimes to go on the computer and write words, write lists of things. Sometimes they're made up words. A lot of them are words but she just likes to play around with letters too (P26, 232-236). But she's – more recently – really into writing poems. And she is writing poems:

The flower smells good.

Flower purple. (P26, 88-90)

I asked if Haley used invented spelling for words that she did not know.

That's interesting because [her sister] absolutely uses all kinds of invented spelling kinds of things. Haley – that hasn't as much been a process for her. I wonder if that's because she's worked so hard and so long to be able to just write that she wants to know how to spell things. So there are some of those words that she would know. She could get started on some of the words, but she would often – she would tell me what she wants to say and ask me to write some of it down. If I'm in the room with her, what I try to do is give her the phonemes and have her figure it out. (P26, 95-102)

Angela and Alexa were less interested in writing activities and used pen and paper less frequently at home than Haley. However, they did make use of their Pathfinders at home, although not for communication. On the questionnaire, Alexa and Angela's mother reported that the children used their communication devices for play and to listen to stories.

Interviewer. How do they use them for stories?

Parent. Again, not going in the direction that the professionals would have wanted, I put a lot of stories in there.

Interviewer. You typed them in?

Parent. Yeah... Stories that they might have had at school that I knew they liked, or *Madeline* even. I don't think I got the whole book in there, but kind of line by line in a sequence.... They still, if they're going to sit down with the Pathfinder, that's still what they'll go to. (P25, 214-242)

Haley's mother reported that Haley rarely used the Pathfinder at home, yet when she did use it, she used it for communication:

Parent: When she uses it, she uses it really appropriately. Which is, if she's exhausted all other ways of trying to get something across to us, then she'll run and get it to spell something out for us sometimes or to pull up a word.

Interviewer. And she's successful in communicating with that when other methods haven't worked?

Parent. Oh yes. Yes, she really is. (P26, 240-248)

Haley's parents reported on the questionnaire that Haley had her own library card and had been to a public library to take out books three or four times in the previous 6 months. Haley had also made eight to ten trips to bookstores in the same

time period. In contrast, Angela and Alexa did not have their own library cards and had not visited a community library in the previous 6 months. Their mother reported that they visited a bookstore every few months.

Although both families provided their children with literacy experiences, Haley's family appeared to have a greater focus on children's literature; books appeared to be more central to leisure time activities in Haley's home. Clearly, there was no need for Haley to have her own library card; her parents could have borrowed books for her on their own cards. This family may have treated the receipt of a library card as a special event – a rite of passage into the world of the prospectively literate. I have no way of knowing this, but I suspect that when Haley got her library card she hugged it, danced around with it, and showed it to all who were willing to look.

Family Factors

All three children came from print-rich home environments where books and literacy were highly valued. Their parents modeled literate behavior, read with them, and had high expectations for their literacy success. Both families committed time and resources to supporting their children in learning to read.

Angela and Alexa's family was somewhat overwhelmed by medical issues, communication challenges, and other competing needs in the first years of their lives. This may have limited the quantity of their early literacy exposure at home. In the third year of the study, the twins' mother took on the task of providing daily, direct reading instruction at home to both Angela and Alexa.

Haley's mother's love of books and reading provided Haley with a rich exposure to children's literature and a powerful motivation for reading. Haley had a sibling two years younger whose literacy level and interests were similar to her own, reinforcing the family's focus on the children's literacy experiences. Books and reading played a central role in Haley's home and family life.

CHAPTER NINE: SCHOOL EXPERIENCES

Angela, Alexa, and Haley entered the preschool special-education program at Valley View School when they were 3 years old, 2 to 3 years prior to the start of this study. When I spoke with the children's parents about their school experiences, both mothers had high praise for the children's first pre-school teacher and credited her with getting their children started on the road to literacy. The teacher who taught that class retired after Angela and Alexa's first year and Haley's second year in the preschool program.

I absolutely attribute so much of [Haley's] ability to read – her reading skills and writing – because I think they just did a wonderful job in her pre-school program and then also with Ms. Grant in kindergarten, of just really hammering down those phonemes. I just think that was crucial and especially for a kid who never got to hear herself say those phonemes. (Haley's mother, P26, 103-107)

That preschool classroom, the first year they were in it, it was run by NM who had a background as a speech person.... The reason I wanted them in that program was because I felt there was a real content to it in terms of early literacy, language, stories.... She held the attention of the kids and made school meaningful for them. She was recognized as a very exceptional teacher. (Angela and Alexa's mother, P25, 134-153)

Classroom Practices

During the three years of this study, the three children were in self-contained special education classes. Despite that consistency, the attention to literacy and the

levels of the teachers' skills, knowledge, and experience varied widely from year-to-year and class-to-class. Some classes provided decoding instruction, silent reading, storybook reading, and writing activities daily; others rarely did. Angela and Haley were exposed to a strong literacy curriculum with daily, systematic instruction for the two years they were in Ms. Grant's class. During those same 2 years, Alexa's school literacy experience was quite different. Her passage from preschool to kindergarten was delayed for a year. When she moved on to kindergarten at Laurel Lake Elementary School she received very little explicit literacy instruction. In fact, Alexa received less instruction at Laurel Lake in a week than Haley and Angela received each day in Ms. Grant's kindergarten at Valley View. By the end of the third year of this study, Alexa had never received the daily, systematic instruction at school that I observed in Ms. Grant's kindergarten in the first year of the study and which is the hallmark of good early literacy education.

In the third year, Angela's experiences in the general-education second-grade classroom provided her with access to broad, appropriate curriculum content. However, her inclusion experiences limited the time available for the decoding instruction she required, and during her second-grade year she fell further behind her peers in reading:

Inclusion's great – but what I think has happened this year is that inclusion in an age-appropriate class and a developmentally appropriate placement socially – has overridden our whole emphasis for literacy acquisition, for communication independence, for communication experience. (Zima, P28, 164-168)

Teacher Knowledge and Experience

Ms. Grant and Ms. Matthews, who each had over 15 years teaching experience, used the same reading curricula as the general-education classes at Valley View, with adaptations and modifications they had developed over the years and continued to develop. Ms. Anderson and Ms. Parker, both relatively new to teaching, reported that it was a struggle to get curricula for their special education classes. When they did get curriculum, they struggled to find the time to become familiar enough with it to use it effectively:

I would have liked training on the curriculum and I would have liked access to the curriculum without having to buy it with my class budget, which I think every special-ed classroom should have, but they don't. (Parker, P29, 296-299)

It's really hard, I must say. It's really hard getting the curriculum that regular-ed kids get. (Anderson, P13, 377-378).

Ms. Grant and Ms. Matthews may have had similar struggles obtaining and becoming familiar with curricula, but if so, those struggles had been resolved years before.

Research has shown that teachers' subject-matter knowledge has an impact on student progress (McCutchen et al., 2002). Experienced, talented teachers fine-tune instruction to meet the specific needs of struggling students (Buly & Valencia, 2003; Stough & Palmer, 2003). Ms. Grant found that Haley and Angela needed very specific step-by-step instruction in areas where typically-developing children often do not. When Haley and Angela's reading progress bogged down, Ms. Grant developed strategies to help the children move forward. In addition, the small size of

the special education classes allowed Ms. Grant and Ms. Matthews to provide the children with considerable individualized attention. Although Ms. Anderson's class was also small and allowed her time to focus on individual children, that attention did not include much academic instruction.

Ms. Parker, Angela and Alexa's teacher in the third year of the study, was a recent graduate of a university special-education master's degree program that focused on the education of students with severe and profound disabilities. That program did not include any classes in methods of reading instruction. In addition to her lack of background in literacy instruction, Ms. Parker often spoke of her own learning disabilities and deficits in phonological awareness. Ms. Parker's focus in the classroom reflected her pre-service background; she was concerned about life-skills, mobility, and self-care at least as much as academics. Although Ms. Parker often read to the children and sometimes read with the children, she provided no explicit instruction in decoding. Ms. Parker relied on the inclusion teachers and Mr. Zima to provide much of the children's literacy instruction.

In the classroom, computer technology was used for literacy activities, often with the help of Ms. Clark, the classroom instructional aide. The support Ms. Clark provided did not include instruction for independent reading and writing. For example, Ms. Clark's clues, designed to help Angela spell *clay*, provided no strategies for independent literacy. Similarly, in Haley's second-grade class, the instructional aide's focus seemed to be helping Haley complete the task, rather than

providing instruction or strategies that Haley could use for decoding or spelling words.

Mr. Zima, a recent graduate of a university masters program in speech, language, and communication, was new to the practical aspects of working in schools but was knowledgeable about literacy research. When I met with him in the third year of the study, he provided his perspective on the children's instructional experiences that year:

I'm learning a lot through this process, too. And although the teachers and therapists alike do good things to support these guys, ... they need a program in place [that is] very systematic and not just on the phonological side, but also on the orthographic side and really understanding word families and really understanding letter patterns. And that doesn't happen. It has to happen every day, every day ... and that's not in place. (P28, 46-52)

Collaboration and Competing Priorities

The children had multiple needs and were receiving services in school beyond the academic instruction that typically-developing children receive. Alexa was learning to drive a power wheelchair; all three of the children received occupational therapy services and speech therapy during the school day. The support service that had the greatest impact on literacy learning was the communication support that the children received from Mr. Zima. In addition to teaching the children to use their communication devices, Mr. Zima was a consistent support over the three years of this study in teaching the children phonemic awareness, sound symbol correspondence, and the relationship between language, communication, and written

text. However, in some cases Mr. Zima and the classroom teachers had difficulty establishing collaborative relationships that allowed them to maximize their support of the children. In addition, time spent learning the symbol system of their communication devices competed for time with learning to read and spell with conventional orthography.

There are many competing priorities in the education of these children. When I interviewed Mr. Zima during the first year of this study he told me, “I could literally spend entire weeks, whole weeks just focusing on one kid and still maybe not get things done” (P3, 617-619). An occupational therapist who worked with Alexa at Laurel Lake School told me, “This is a child where there is not enough time in the day for her. Everyone would like more time” (P18, 66-67). Angela and Alexa’s mother reported, “With these kids, it’s always trade-offs. I don’t want to trade off too much of what is good about what is happening, so we’re doing [decoding] at home” (P25, 866-867). When there are competing priorities and time is limited, some educational areas will likely be short-changed. When these children were in a class with a teacher who lacked experience with literacy instruction, it was the children’s literacy education that was inadequately addressed.

School Factors

Factors in school that supported or impeded literacy varied from year to year and class to class. Classroom placement and teacher knowledge were primary factors that determined the quality of literacy instruction that the children received each year. The children required, but often lacked, a literacy specialist on their teams.

Inclusion activities provided the children with a broader range of literacy activities but competed for time with appropriate decoding instruction at their level. The children's multiple needs made collaboration between educators essential for optimum instruction, yet collaboration efforts often fell short. Competing priorities and the children's multiple needs limited the time available for any one activity, including literacy instruction.

On the positive side, the children received a good foundation in phonological and phonemic awareness at school and learned to use technology for participation in literacy activities. All three children were motivated to learn to read and enjoyed reading activities at school.

CHAPTER TEN: INDIVIDUAL DIFFERENCES

Individual characteristics of the child have their roots in both nature and nurture. Home and school factors can either positively or negatively impact characteristics considered to be inherent to the child. Some physical characteristics such as a speech disorder or a hearing impairment are less directly impacted by environmental factors, but clearly the environment can shape the child's experience of and adaptation to those physical traits. It is more apparent how characteristics such as motivation or phonological awareness may be impacted by factors at home and school.

The three children in this study had characteristics in common that interfered with both language and literacy development. The children's oral-motor impairments limited their experience with speech and language production. The children did not have the experience of hearing themselves produce the phonology of the language. As they learned connections between letters and the sounds of speech they were not able to experiment with phonological recoding; they were not able to blend the sounds orally and listen to their own speech in order to identify written words. The children's physical disabilities also restricted their exploratory experiences with crayons and paper and therefore with scribbling, forming letters, and experimenting with written words and invented spelling. Although the three children had these limitations in common, they also had individual, distinct traits that impacted their literacy and academic development.

Angela

The adults who worked with Angela agreed that she was very bright. Ms. Grant described her language comprehension as “excellent” (P14, 84). Ms. Parker reported:

She’s at the point where she understands what is being read to her and can answer very complex questions and make predictions. So, she’s on par or even slightly above the 2nd graders for that type of reading. (Parker, P29, 129-132)

Angela had a good memory; she was bright, sensitive, and loved books. She was purposeful and motivated when she was engaged in a task, as when she created a Mother’s Day card independently. “I think she remembers a ton of things and she certainly pays better attention in general ed ... than most of the students in the general-ed class” (Parker, P29,451-453). Angela was a serious, well-behaved student who wanted to do well in school. However, her desire to do well at school had a negative corollary; she was uncomfortable when she could not keep up with her peers or when she did not know the answers. Her mother told me, “I have a sense that she just really puts a lot of pressure on herself. She doesn’t feel good when she doesn’t know stuff.... She’s competitive” (Angela’s mother, P25, 406-424).

Although Angela’s speech was difficult to understand, it did not seem to be an effort for her to produce speech and she spoke in longer utterances than either Haley or Alexa. Angela was the child in this study with the clearest speech; yet she also experienced the greatest distress when she was misunderstood. Fear of being misunderstood limited her language production and communication interactions.

Angela appeared to be aware of her differences and this greater self-awareness sometimes led to self-consciousness.

Angela had difficulty generating text for school assignments and at times became passive and resistant in writing activities. This was one trait that Angela and Alexa shared: passive resistance when tasks were seen as difficult and undesirable. Angela generated text more successfully when she worked with Mr. Zima, who provided a higher level of scaffolding. Yet even with that support, Mr. Zima reported in Angela's IEP at the end of the third year the study, "She does not currently write sentences independently" (Zima, P41).

Both her mother and Ms. Grant reported that Angela did not enjoy school. "School was work for her and I don't think she particularly liked school" (Grant, P14, 295-296). "Even though she now recollects how much she loved Ms. Grant, there was a period ... when she didn't want to go to school.... She didn't like all the work" (Mom, P25, 401-404).

Angela's mother discussed the characteristics that impacted literacy learning as well as her own expectations for Angela:

On the challenges side, I think there's just something hard about it for her.... I think she'll learn to [read] and I think she'll learn to do it well. I think she'll probably do a lot of [reading] in her life. I think her memory is a plus for her. And I think she's got a lot of language ability when she's reading stuff that ... makes sense language-wise. I think that helps her a lot.... She's struggling with the mechanics of it, because the mechanics don't seem to be coming that easily. (P25, 526-535)

Despite her difficulties with the mechanics of reading, her teachers had high expectations for her. “I see her going to college probably.... She’s a bright little girl” (Grant, P14, 325-326).

Haley

Haley’s enthusiasm, motivation for reading, and love of books were great strengths:

If she gets a new book she’s always, always taking time out of doing something else to tell me how important this is, or where she got the book, or that it’s hers to keep, or that she likes to read this one, or what have you. So she’s just really excited about literacy. (Zima, P28, 11-15)

Unlike Angela, Haley loved school, enjoyed writing and was never at loss for things to write about. Her teachers reported that she was a diligent worker and an enthusiastic learner. Her efforts at printing with a pencil attest to her persistence and diligence. She was a committed communicator and she had a repertoire of communication strategies. If her speech was not understood, she was willing to repeat herself multiple times, rephrase her utterances, or use sign language and gestures. She was the only one of the three who used her communication device to repair communication breakdowns. She did not become discouraged in the face of challenges. She was a self-advocate; she let people know when she could not hear and when she did not understand. She asked for clarification and help when she needed it.

She's not shy.... She has confidence in herself that I hope she'll be able to maintain as she moves through her educational career.

(Matthews, P30, 216-219)

She is motivated. She's attentive. She is very enthusiastic. She participates in class. She takes risks. (P30, 45-46)

Haley also had inherent characteristics that presented significant challenges.

Her speech production was slow, effortful, and quite difficult to understand. Her speech sometimes came out in short bursts as if forced out with great effort. She had limited experience producing longer, multiword utterances. Her phonological and language processing abilities were likely impacted by her hearing impairment. Ms. Grant reported that Haley's language development was delayed and her listening comprehension was below that of her age-peers. Haley's difficulty with visual tracking presented impediments to taking information from written text and learning to read. All of these challenges led to some concern about Haley's eventual reading success. Nonetheless, the adults who worked with her remained cautiously optimistic. A comment I found in her school record provided an insightful assessment of Haley's abilities, "Her willingness to try everything and her common sense make her far more functional than her ... test scores would indicate" (Pre-School OT evaluation, P43).

Alexa

Alexa loved storybook reading, was assertive about making her desires known, and was quick to find humor in everyday situations. She appeared to have a good auditory memory and was surprisingly good at identifying words by blending individual phonemes that were spoken by an adult. Her graphophonemic knowledge

and ability to blend sounds supported her literacy development. When Alexa was engaged in an activity that she enjoyed, such as reading or writing about a topic of interest to her, she was an enthusiastic student. She was friendly, outgoing, unselfconscious, and fun to work with. She was persistent when her speech was not understood. “She’s very good about repeating and repeating and then if you say, ‘I’m sorry I just don’t understand you’ ... she’ll try again and again and again” (Anderson, P13, 225-227).

On the other hand, Alexa sometimes refused to participate or cooperate and occasionally had full-blown tantrums. “When she doesn’t want to do something, then it’s the shutdown mode, and it’s not because she can’t communicate, but it’s because she just doesn’t want to do it” (Anderson, P13, 231-233).

She’s such a funny kid. I think her biggest weakness is that she often just refuses. She just decides that this is not what she wants to do and she’s not going to do it. And she is very very stubborn.... You cannot approach this child with a “you need to follow what I’m saying” attitude, because it won’t happen. It gets very bad. She has a very good sense of humor and when you use her humor to help her work and direct her in her work, she’s very happy and she does good work. (Parker, P29, 986-993)

In addition, Alexa had significant physical disabilities; all of the activities of daily living took more time and tired her out. When she was fatigued she often refused to cooperate. Her noncompliance coupled with her fatigue and communication difficulties often interfered with her literacy learning.

Although some adults felt that Alexa's behavior was arbitrary, there were indications that it might have been purposeful or communicative. At times her refusals to work seemed based on a reluctance to try activities when she believed she would not succeed. Ms. Anderson reported, "New concepts or introducing something new is usually when she does the shutdown thing" (P13, 269-270). Ms. Wood, who made sure that Alexa always felt successful, reported that Alexa was cooperative and hard-working with her. Fatigue was also a factor in her refusals. Mr. Zima developed a strategy of giving her breaks when she refused to work and letting her decide when she was ready to work again:

She'd kind of put her head down and wouldn't do the work.... So I started just giving her pauses, giving her these little breaks, so kind of easing it up, not pushing her into doing the writing, if it was a push. And then she seemed to come out of breaks gradually and into just writing more and saying things like, "What's next?" (Zima, P15, 433-435)

Alexa's noncompliance and her tantrums sometimes seemed like self-advocacy gone awry. She was ardent about standing up for what she desired and she insisted that her voice be heard; however, her communication skills were limited. Unlike Haley, she did not have a repertoire of communication strategies and often simply repeated the same unintelligible remark over and over again.

Alexa became upset when communication partners gave up on their efforts to understand her. One afternoon when I arrived in her classroom, Ms. Parker told me that Alexa had had a particularly difficult tantrum that morning. I asked if she knew the cause. Ms. Parker told me that Alexa had wanted a glass of water and hadn't

been understood. A few days after that incident, Alexa was diagnosed with juvenile diabetes. One hallmark symptom of diabetes is extreme thirst. After her diagnosis, the adults began to notice a pattern of refusals to cooperate in physically demanding tasks when her blood sugar was low. Alexa's mother shared her perspective on Alexa's experience in Ms. Parker's class:

Ms. Parker went in with a model that said, "Physically-disabled kids resist these things because they're hard. So I'm going to push and push and I'm not going to let her get away with that sort of thing." And now we're seeing this pattern where the resistance is there when her blood sugar is low.... So Alexa was stuck, you know. Just acting some way to express herself or meet her own needs that nobody could really fathom. (Alexa's mother, P25, 486-493)

Despite all of her challenges and the mixed reviews from her teachers, my own expectations for Alexa are high. I believe her strong personality and sense of humor are indications of her inherent strength. Coupled with her love of books, graphophonemic knowledge, and phonological processing skills, I expect she will one day be a successful reader. As she matures and her communication skills improve, she may learn more functional and appropriate self-advocacy strategies. Like Ms. Reynolds, I believe Alexa's tenaciousness will serve her well in the long run.

Impact of Inherent Factors

All three children had speech and motor disabilities that limited their experiences with language and communication as well as their interactions with the physical environment. Nonetheless, the children all developed phonological

awareness and graphophonemic knowledge and were motivated to learn to read. On the other hand, the children were very different from one another with regard to their strengths, personalities, and behaviors. Each of the children had characteristics that supported literacy development and other traits that interfered with literacy development. Language skills, love of books, listening comprehension, phonological awareness, and persistence were among the individual traits that supported literacy learning in the children. Sensory impairments, fatigue, health impairments, behavioral challenges, and discouragement were among those that interfered. An examination of inherent characteristics highlights how difficult it can be to generalize about a population based on disability and how necessary it is to individualize instruction and customize interventions to meet the needs of the individual child.

CHAPTER ELEVEN: THE ROLE OF TECHNOLOGY

Technology was an integral part of the educational experience for the three children in the study. They used laptop and desktop computers as well as their Pathfinder communication devices. The children used technology for access to digital books and software, for shared communication in the classroom, and for writing and composition.

Digital Books and Literacy Software

Of the three children, Alexa had the greatest exposure to children's literacy software and digital books on compact disc (CD). She clearly enjoyed looking at digital books and playing the associated games that were included on the CDs. The academic efficacy of the literacy software was not clear. When I watched Alexa use a phonics software program in Ms. Anderson's class, I was unsure if her errors were the result of motor difficulties, not knowing the correct answer, or some other factor. In the third year of the study, Alexa used an oversized keyboard that made key selection more straightforward for her. She also used a joystick-style mouse emulator. However, when I watched her using the literacy software, it seemed that her focus and attention were often on the motor activity of using the joystick to move the cursor, rather than the literacy content of the activity.

Augmentative Communication Devices

All three of the children in this study began learning to use their communication devices while they were in preschool at Valley View Elementary School, the year before the start of this study. When Mr. Zima was hired by the

school district to support children who used augmentative communication, it was his first job after completing a master's program in speech pathology. He was very thoughtful and committed but had little experience working in a school setting. In the first year, his frustration was sometimes evident as he struggled to find ways to engage the children with the very complex device they were learning to use:

I've tried teaching vocabulary items that I try to put into some kind of fun context, but they're not too interested.... But I also know that we have a complex tool ... and Haley and Angela have higher-level language skills than they are able to express using their devices, because they don't have access to the vocabulary. But to access vocabulary we have to learn the icon sequences. It gets very tricky in teaching icon sequences because they have so much language, it's almost insulting, you know – there's a sense that it's almost insulting to them just to teach a single or two words. (P3, 654-669)

Despite its complexity, Haley was enthusiastic about the Pathfinder from the beginning; she often commented, "I love my Pathfinder." Her mother reported that, from the time she first received it, Haley wanted to take the Pathfinder with her wherever she went, even though she had little skill at using it for communication. By the end of the study, Haley was the only child who used the Pathfinder for communication, although she did so infrequently. Although Alexa appeared to enjoy using her Pathfinder at school for the weather song and other preprogrammed activities, in the first two years of the study she was sometimes uncooperative when Mr. Zima tried to teach her to use it for communication. Over time she became more interested in creating stories and completing assignments on it with Mr. Zima's

support. Her mother reported that Alexa sometimes played with the Pathfinder at home.

Angela used the Pathfinder to create journal entries and stories during the first two years of this study, but she did not initiate its use on her own or use it for communication. By the third year of the study, she was using a computer, exclusively, for writing and was not interested in using the Pathfinder at all for communication.

In the first two years of the study, the three children used the devices in the classroom for preprogrammed sharing activities. They accessed messages that had been stored with help from their parents. Alexa continued this activity in the third year:

[Alexa] uses it to present things in kindergarten class, things she's prepared at home with mom, like homework about her weekend.... But she is not proficient on it, so it's not an effective tool for her to answer a question.... She just goes to the page and pushes the button, or pushes the multiple buttons to tell the story. The story has a sequence, so she can do that. (Parker, P29, 884-897)

The use of the AAC devices created some tensions at school. The devices were complex to learn and they provided challenges as well as benefits in the classroom; use of the Pathfinders slowed the pace of classroom activities. The classroom teachers discussed the difficulty they had integrating the technology into classroom projects and events. "We can't always pace things to include her ability to use the Pathfinder. We try to sometimes, but we can't do that all the time" (Reynolds, P2, 283-285). None of the classroom teachers was able to offer much

assistance when the children had difficulty using the devices. Even Ms. Parker, who was the most technologically sophisticated of the classroom teachers, felt inadequate when dealing with the children's communication devices. "I went to the Pathfinder class, but doing a one-day seminar on the device and actually being able to use it are totally different things" (P29, 920-921). "I can't teach proficiency on it when I don't have proficiency on it" (P29, 898-899).

Learning Two Symbol Systems

By the end of the study, Angela was not using her Pathfinder; she used a laptop computer and word-prediction software to complete her written work. Haley and Alexa continued to use their Pathfinders and the icon-based software for most written work, but they also used keyboard entry with the alphabet for some activities.

In teaching the children to write and spell, the use of the Pathfinder was a complicating factor. The children were learning both the Pathfinder's icon-based system and the alphabetic system and they did not have facility with either. During writing activities using the Pathfinder's icon-based system, the children selected symbols based on semantic associations and categories, rather than phonology and spelling patterns. Time spent learning the icon system competed for time with learning to read and spell. As Ms. Matthews reported, Haley's time writing with Mr. Zima limited her practice with conventional writing and spelling.

For Haley and Alexa, the primary benefit of learning the icon-based system was for future communication. They were learning to use a tool that, once mastered, would allow them to communicate with a larger number of people on a broader

range of topics than their speech would allow. The Pathfinder, though imperfect, had been deemed the most promising communication tool for these children. Practicing with the icon sequences during composition activities provided the children with opportunities to develop skill at using the tool.

Moreover, even when the children used icons for composition, the output produced was conventional print. When the children read the words they had written, they were reading standard text. Regardless of the input method, the use of technology provided the children with a means to create and see their words on paper. This was a powerful tool for children whose speech was difficult to understand and whose attempts at spelling were unsuccessful.

Written Communication

The use of technology for writing and composition made it possible for the children to participate in academic writing activities at school. It did not lead to the level of letter play that typically developing children enjoy, but it did introduce them to the experience of getting their words and ideas on paper, preserved for future access. Technology opened the door to text production and gave the children's words a clarity that their speech lacked. There is no mistaking the meaning of this journal entry by Angela:

I want a real dog, but I didn't get a real dog. I got a toy dog. I want a real dog and I want it right now! I never had a dog in my whole life.
(P41)

Using speech, Angela could not have conveyed this message as clearly and unambiguously. For a child whose spoken words are often misunderstood, the

written word can hold great power. Perhaps it was the clarity of presentation that Haley found so compelling about her own written work.

Technology Support and Teacher Training

Angela, Haley, and Alexa were very comfortable using technology and had a good foundation in the use of the tools that they would need throughout their academic careers. Yet, Ms. Parker expressed concern that the school district might not be equally prepared:

I think [Angela's] most likely to be in a general-education setting by the time she's out of elementary school. The one down side is she's going to be relying on assistive technology and that technology takes maintenance and it also takes creating adaptations for her, setting them up. And I don't see that the district has any plan for down the road for having to deal with students that are included in a general-education setting that have technology and need assistance with maintaining it and with using it in the classroom. (P29, 180-187)

When I asked the teachers about access and availability of technology, their responses often related to training:

I think that there's tons of stuff out there and we just don't have funds ... mainly it's funds to get these things and to be trained on them. That's the big thing. They always ask, "Do you want something?" And I'm like, "Well, are you going to teach me how to use it? Or teach me how to have the kids use it?" And a lot of times that's not there. (Anderson, P13, 435-437)

The software that I have in the class is great, but ... how can I learn it and get to know it and get comfortable with it? (Parker, P29, 929-931)

We were fortunate to get everything that we got. It's just that along with that there was no set-up for training.... There probably should've been a plan for, or funds set aside for, the training aspect of it. (Parker, P29, 946-951)

Challenges and Benefits

The use of the Pathfinder reinforced for the children the interaction and connection between speech and written text. Once mastered, the children's communication devices had the potential to provide them with a reliable means of communication with unfamiliar partners. However, the devices were complex and challenging for the children to learn and to use. The children were learning two symbol systems simultaneously, and their competence with either system was limited. The classroom teachers were not proficient with the communication devices and struggled to incorporate their use into classroom activities.

The use of technology provided the children with access to academic software, digital books, and tools for composition. Technology provided the children with the potential for academic independence and the opportunity for self expression and clear communication. Angela, Alexa, and Haley would continue to rely on technology throughout their academic careers and their early experiences helped them become comfortable and competent with its use.

CHAPTER TWELVE: DISCUSSION, IMPLICATIONS, AND CONCLUSION

Speech, Language, and Literacy

The children in this study did not learn to use articles and morphological word-endings in the intuitive manner of children learning their native language. Instead, Ms. Grant reported that she needed to teach the children “every single thing,” including aspects of language that typically-developing children learn spontaneously, without instruction. The lack of opportunity for verbal rehearsal and auditory review of their own speech had interfered with some aspects of language learning. There may be aspects of language that are learned through repetition in oral-motor memory as well as in cognitive memory. Fifty percent of the language that 2-year-olds are exposed to is their own speech (Hart & Risley, 1999). Children who are learning language do a great deal of verbal rehearsal; they practice, repeat, and learn.

Vygotsky (1986) put forward the view that the chatter of young children that was labeled *egocentric speech* by Piaget (1926) is a transitional step in attaching language to thought; children think out loud using words and language before they are able to accomplish that cognitive process silently. Reading aloud plays a similar, transitional role in learning to read; it provides a bridge to silent reading. When children are taught to read, they are asked to sound out words and to read aloud, even though the ultimate goal of reading instruction is silent reading. Reading aloud provides the child with oral and aural practice in blending, segmenting, and reading – before those tasks are taken on in working memory. The child reading aloud can hear

and evaluate the results of her efforts. The transitional step of reading aloud also provides the teacher with the opportunity to evaluate the child's progress, correct errors, and offer support as needed. This study looked at the literacy development of children who, as a result of motor-speech impairments, had incomplete access to that transitional step in learning to read.

In reading aloud, children use their graphophonemic knowledge to segment and blend words. For the children in this study who did not have the benefit of accurate speech, graphophonemic knowledge was not enough to enable them to segment and blend. Mr. Zima reported that the children had strong inner-speech systems; they knew the initial letter of a word even when they could not articulate the corresponding phoneme. However, their inner-speech systems were not fully developed. The children were not able to retrieve and blend phonemes in working memory in order to decode words nor were they able to segment words in working memory in order to accurately spell words. The core phonological processes important to literacy include phonological awareness, retrieval of phonological information from the lexicon, and assembly of phonological information in working memory (Troia, 2004). The children in this study were able to accomplish each of those component processes individually, when the other sub-processes were supported by an adult, but they were not able to accomplish the entire process of decoding words in working memory.

O'Connor and Bell (2004) reported that some students with reading disabilities who had received reading instruction for two to four years, "were unable

to blend isolated speech sounds prior to direct instruction in blending” (p. 487). In the same way, Angela, Alexa, and Haley required direct instruction to address their specific needs. The children needed instruction in segmenting and blending aloud the sounds that they could articulate as well as strategies for segmenting and blending, in working memory, those sounds that they could not articulate.

Implications for Instruction

It is important to keep in mind that reading did not come easily to the adult fluent readers with motor-speech disabilities in the Koppenhaver, et al. (1991) study. Despite the fact that they eventually became skilled readers, as children many of the study participants needed considerable help; more than half attended summer school or received tutoring to support literacy learning. All of the study participants reported receiving help at home; one fourth reported that “every member of the immediate family” had been very important in helping them learn to read and write (p. 25).

Learning to read is not a trivial task for any child. For children with significant motor-speech disabilities, learning to read requires extraordinary effort – from teachers, parents, and the children themselves. At present, teachers and researchers do not know the best practices for supporting children with motor-speech disabilities in their quest for fluent literacy. Intervention studies, case studies, classroom ethnographies, and single subject experimental studies are all needed to uncover the instructional strategies that will best meet the needs of the children. In the absence of information specific to this population, the broad guidelines for high-quality reading instruction for all children must be followed – daily, clear,

systematic, phonics-based instruction (Ehri, Nunes, Stahl, & Willows, 2001; O'Connor & Bell, 2004).

Learning to Read and Reading to Learn

It is often said that in the first few years of school, children learn to read; then the focus shifts and the children read to learn. Limiting reading instruction to the first two or three years of school does not serve any child who continues to struggle with decoding. Decoding instruction must continue as long as necessary: until the children are able to read unfamiliar words independently. In addition to instruction, the children require frequent encounters with words in print; they need to practice reading and they need support as they practice.

Technology provided Angela, Alexa, and Haley with a means of written expression. Technology can also provide support for reading. Software that provides synthesized speech can read individual words or passages in electronic books when inaccurate or slow decoding impacts the child's comprehension of the text. When the child's reading ability limits access to textbooks, assistive technology can provide access to subject matter content as well.

Teacher Skills and Knowledge

Pre-service teachers are not taught strategies for teaching reading to children who cannot articulate the sounds of speech. These children need creative, innovative teachers with expertise in literacy instruction; yet children with motor-speech disabilities are frequently in classes with teachers who have little or no literacy training or background. From my experience, it appears that children are often

assigned to classes based on their physical abilities and needs rather than their academic needs. Educators who are familiar with this population rarely have literacy expertise and teachers who have literacy expertise are often unfamiliar with the complex needs of these children. A literacy specialist is a critical member of the IEP team for a child with motor-speech impairments. That specialist may be the classroom teacher. But if the classroom teacher lacks that expertise, another team member is required who can be closely involved with the child's day-to-day instruction and who will support the classroom teacher in maximizing the child's literacy-learning experience. The literacy teacher must be able to adapt, accommodate, and individualize instruction to meet the child's specific needs and must be prepared to revisit the instructional strategies as the child's skills develop and needs change.

Conclusion

Although all three children were close to performing at grade level in emergent and beginning reading skills at the start of the study, two years later all three had fallen well below their typically-developing peers in reading and writing. Phonological awareness and alphabetic knowledge are primary predictors of reading outcomes; one might assume those factors would be the primary difficulties faced by children with significant speech disabilities. However, that was not the case for the three children in this study. All three children learned letter-sound correspondences, including correspondences for phonemes that they couldn't articulate. Yet, they had difficulty using their knowledge and awareness to decode and spell words.

All three children were motivated to learn to read and came from homes that supported their literacy development. The quality of instruction the children received at school was inconsistent from child to child and varied considerably from class to class. When the children received systematic, direct instruction, they made progress – although the progress was often slow. Use of technology provided the children with a means of written expression. Their AAC devices reinforced the connection between speech and text but did not provide a means of functional communication for the children. The children’s complex needs made a team approach necessary; however, collaboration between team members was not always successful. Competing priorities and the children’s multiple needs limited time spent on literacy instruction.

Factors in the home and school and characteristics inherent to the children can impact literacy learning both positively and negatively. Families of children with disabilities should be supported and encouraged to include storybook reading and other literacy activities in their children’s lives from their earliest days and to read with the children every day as the children get older and begin to learn to read. At school, daily, systematic decoding instruction must continue for as long as necessary – perhaps well beyond the first few years of school.

Research is needed to identify the best practices in literacy instruction for children with complex communication needs. Although factors within the home and child impact literacy learning, educators and researchers would do well to focus on factors in the classroom – both because that is where we can have the greatest impact

and because there is a great need for improvement. Literacy is the key to language and communication competence for children whose speech is limited by physical disabilities. Aspects of language that the children have not learned through experience with speech production, they will learn as they become readers and writers. Educators have a responsibility to identify, develop, and put into practice instructional strategies that will lead children with physical and speech disabilities through the processes of literacy learning to the goal of fluent, proficient reading and writing.

ENDNOTES

- ¹ Lobel, A. (1972). *Mouse Tales*. New York: Harper Collins.
- ² The *Pathfinder* is a voice output communication device available from Prentke Romich Company of Wooster, OH. <http://www.prentrom.com>
- ³ *Semantic compaction* is a registered trademark of Semantic Compaction Systems, Wooster, Ohio. <http://minspeak.com>
- ⁴ *Co:Writer*. Software program. Don Johnson, Inc., Volo, IL. <http://www.donjohnston.com/catalog/cowriters.htm>
- ⁵ *Sound Partners*. Washington Research Institute, Seattle, WA. <http://wri-edu.org/partners/>
- ⁶ *Clifford the Big Red Dog: Phonics Fun Reading Program*. New York: Scholastic.
- ⁷ Eaton, D. (1995). *How to make a mud pie*. New York: Hyperion.
- ⁸ Guest, E.H. (2002). *Iris and Walter: The sleepover*. New York: Harcourt.
- ⁹ Ada, A.F. *The kite*. Houghton Mifflin Grade 1 Reading Series.
- ¹⁰ Bemelmans, L. (1939, 1967). *Madeline*. New York: Viking.
- ¹¹ Englemann, S, & Bruner, E. (1969). *Distar reading program*. Chicago: SRA.
- ¹² Brink, C.R. (1935, 1962). *Caddie Woodlawn*. New York: Simon & Schuster.
- ¹³ Cronin, D. (2002). *Giggle, giggle, quack*. New York: Simon & Schuster.
- ¹⁴ Geisel, T.S. (1960). *Green eggs and ham (by Dr. Seuss)*. New York: Random House.
- ¹⁵ Maslen, B.L. *Bob books: Level A*. New York. Scholastic.
- ¹⁶ Dahl, R. (1982). *The BFG*. New York: Farrar, Straus and Giroux.

BIBLIOGRAPHY

- Aaron, P. G., & Joshi, R. M. (1992). *Reading problems: Consultation and remediation*. New York: Guilford Press.
- Abramson, L. Y., Seligman, M. E., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology, 87*(1), 49-74.
- Adams, M. J. (1990). *Beginning to read: Thinking and learning about print*. Cambridge: MIT Press.
- Alexander, A. W., Anderson, H. G., Heilman, P. C., Voeller, K., & Torgesen, J. K. (1991). Phonological awareness training and remediation of analytic decoding deficits in a group of severe dyslexics. *Annals of Dyslexia, 41*, 193-206.
- Altheide, D. L., & Johnson, J. M. (1994). Criteria for assessing interpretive validity in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 485-499). Thousand Oaks, CA: Sage.
- Anfara, V. A., Brown, K. M., & Mangione, T. L. (2002). Qualitative analysis on stage: Making the research process more public. *Educational Researcher, 31*(7), 28-38.
- Atkinson, P., & Hammersley, M. (1998). Ethnography and participant observation. In N. K. Denzin & Y. S. Lincoln (Eds.), *Strategies of qualitative inquiry*. Thousand Oaks, CA: Sage.
- Baddeley, A. D. (1982). Reading and working memory. *Bulletin of the British Psychological Society, 35*, 414-417.
- Baddeley, A. D., & Lewis, V. (1981). Inner active processes in reading: The inner voice, the inner ear, and the inner eye. In A. M. Lesgold & C. A. Perfetti (Eds.), *Interactive processes in reading*. Hillsdale, NJ: Lawrence Erlbaum.
- Baddeley, A. D., & Wilson, B. (1985). Phonological coding and short-term memory in patients without speech. *Journal of Memory and Language, 24*, 490-502.
- Baker, L., Scher, D., & Mackler, K. (1997). Home and family influences on motivations for reading. *Educational Psychologist, 32*(2), 69-82.
- Ball, E. W., & Blachman, B. A. (1991). Does phoneme awareness training in kindergarten make a difference in early word recognition and developmental spelling? *Reading Research Quarterly, 26*, 49-66.
- Bandura, A. (1997). *Self efficacy: The exercise of control*. New York: W.H. Freeman.
- Batshaw, M. L. (1997). *Children with disabilities* (4th ed.). Baltimore: Brookes.

- Becker, H. S. (1990). Generalizing from case studies. In E. W. Eisner & A. Peshkin (Eds.), *Qualitative inquiry in education: The continuing debate* (pp. 233-242). New York: Teacher College.
- Becker, H. S., & Geer, B. (1969). Participant observation and interviewing: A comparison. In G. J. McCall & J. L. Simmons (Eds.), *Issues in participant observation*. Reading, MA: Addison-Wesley.
- Becker, R. D. (1975). The restrictive emotional and cognitive environment reconsidered: A redefinition of the concept of therapeutic restraint. *Israel Annals of Psychiatry and Related Disciplines*, 13, 239-258.
- Berninger, V. W., & Gans, B. M. (1986). Assessing word processing capability of the nonvocal, nonwriting. *Augmentative and Alternative Communication*, 56-63.
- Berninger, V. W., & Gans, B. M. (1986). Language profiles in nonspeaking individuals of normal intelligence with severe cerebral palsy. *Augmentative and Alternative Communication*, 2, 45-50.
- Beukelman, D. R., Mirenda, P., & Sturm, J. (1998). Literacy development of AAC users. In D. Beukelman & P. Mirenda (Eds.), *Augmentative and alternative communication: Management of severe communication disorders in children and adults* (2nd ed., pp. 355-390). Baltimore: Brookes.
- Bird, J., Bishop, D. V. M., & Freeman, N. H. (1995). Phonological awareness and literacy development in children with expressive phonological impairments. *Journal of Speech and Hearing Research*, 38, 446-462.
- Bishop, D. V. M., Brown, B. B., & Robson, J. (1990). The relationship between phoneme discrimination, speech production, and language comprehension in cerebral-palsied individuals. *Journal of Speech and Hearing Research*, 33, 210-219.
- Bishop, D. V. M., & Robson, J. (1989). Accurate non-word spelling despite congenital inability to speak: Phoneme-grapheme conversion does not require subvocal articulation. *British Journal of Psychology*, 80, 1-13.
- Blischak, D. M. (1994). Phonologic awareness: Implications for individuals with little or no functional speech. *Augmentative and Alternative Communication*, 10, 245-254.
- Blischak, D. M. (1995). Thomas the writer: Case study of a child with severe physical, speech, and visual impairments. *Language, Speech, and Hearing Services in Schools*, 26, 11-20.
- Bogner, K., Raphael, L., & Pressley, M. (2002). How grade 1 teachers motivate literate activity by their students. *Scientific Studies of Reading*, 6(2), 135-165.
- Bradley, L., & Bryant, P. (1985). *Rhyme and reason in reading and spelling*. Ann Arbor: University of Michigan.

- Brantlinger, E., Jimenez, R., Klingner, J., Pugach, M., & Richardson, V. (2005). Qualitative studies in special education. *Exceptional Children, 71*(2), 195-207.
- Brinker, R., & Lewis, M. (1982). Discovering the competent handicapped infant: A process approach to assessment and intervention. *Topics in Early Childhood Education, 2*(2), 1-16.
- Brown, C. (1954). *My left foot*. London: Martin Secker & Warburg: Norton.
- Buly, M. R., & Valencia, S. (2003). *Meeting the needs of failing readers: Cautions and considerations for state policy* (Center for the Study of Teaching and Policy No. 0-03-1). Seattle: University of Washington.
- Burgstahler, S., & Comden, D. (2002, June). Working together: Computer technology and people with mobility & sensory impairments. *Exceptional Parent, 28*-36.
- Bus, A. G., & van Ijzendoorn, M. H. (1999). Phonological awareness and early reading: A meta-analysis of experimental training studies. *Journal of Educational Psychology, 91*(3), 403-414.
- Bus, A. G., van Ijzendoorn, M. H., & Pellegrini, A. D. (1995). Joint book reading makes for success in learning to read: A meta-analysis on intergenerational transmission of literacy. *Review of Educational Research, 65*(1), 1-21.
- Butler, C. (1986). Effects of powered mobility on self-initiated behaviors of very young children with locomotor disabilities. *Developmental Medicine and Child Neurology, 28*, 325-332.
- Caelli, K., Ray, L., & Mill, J. (2003). 'Clear as mud': Toward greater clarity in generic qualitative research. *International Journal of Qualitative Methods, 2*(2).
- Campbell, R. (1992). Speech in the head? Rhyme skill, reading, and immediate memory in the deaf. In D. Reisberg (Ed.), *Auditory Imagery* (pp. 73-93). Hillsdale, NJ: Erlbaum.
- Carnine, D. W., Silbert, J., & Kameenui, E. J. (1997). *Direct Instruction Reading* (3rd ed.). Upper Saddle River, NJ: Prentice Hall.
- Chall, J. S. (1983). *Stages of reading development*. New York: McGraw-Hill.
- Chard, D. J., & Kameenui, E. J. (2000). Struggling first-grade readers: The frequency and progress of their reading. *Journal of Special Education, 34*(1), 28-38.
- Chomsky, C. (1971). Write first, read later. *Childhood Education, 47*(6), 296-299.
- Chomsky, N. (1988). *Language and problems of knowledge*. Cambridge: MIT Press.
- Chomsky, N. (1993). *Language and thought*. Wakefield, RI: Moyer Bell.

- Cowan, W. E., & Moran, M. J. (1997). Phonological awareness skills of children with articulation disorders in kindergarten to third grade. *Journal of children's communication development*, 8(2), 31-38.
- Coleman-Martin, M. B., Heller, K. W., Cihak, D. F., & Irvine, K. L. (2005). Using computer-assisted instruction and the Nonverbal Reading Approach to teach word identification. *Focus on Autism and Other Developmental Disabilities*, 20(2), 80-90.
- Cox, B. E., Fang, Z., & Otto, B. W. (1997). Preschoolers' developing ownership of the literate register. *Reading Research Quarterly*, 32(1), 34-53.
- Cunningham, A. E., Perry, K. E., Stanovich, K. E., & Stanovich, P. J. (2004). Disciplinary knowledge of K-3 teachers and their knowledge calibration in the domain of early literacy. *Annals of Dyslexia*, 54(1), 139-167.
- Cunningham, A. E., & Stanovich, K. E. (1998). What reading does for the mind. *American Educator*, Spring/Summer, 8-15.
- Dahlgren-Sandberg, A. (2001). Reading and spelling, phonological awareness, and working memory in children with severe speech impairments: A longitudinal study. *Augmentative and Alternative Communication*, 17, 11-26.
- Dahlgren-Sandberg, A., & Hjelmquist, E. (1996). Phonologic awareness and literacy abilities in nonspeaking preschool children with cerebral palsy. *Augmentative and Alternative Communication*, 12, 138-153.
- Dahlgren-Sandberg, A., & Hjelmquist, E. (1997). Language and literacy in nonvocal children with cerebral palsy. *Reading and Writing: An Interdisciplinary Journal*, 9, 107-133.
- Daniels, L. E., Sparling, J. W., Reilly, M., & Humphry, R. (1995). Use of assistive technology with young children with severe and profound disabilities. *Infant-Toddler Intervention*, 5(1), 91-112.
- DeBaryshe, B. D. (1993). Joint picture-book reading correlates of early oral language skill. *Journal of Child Language*, 20, 455-461.
- DeCastel, S., & Luke, A. (1988). Defining literacy in North America. In E. R. Kintgen, B. M. Kroll & M. Rose (Eds.), *Perspectives on Literacy*. Carbondale: Southern Illinois University Press.
- Deitz, J. (1998). Pediatric augmented mobility. In D. B. Gray, L. A. Quatrano & M. L. Lieberman (Eds.), *Designing and using assistive technology* (pp. 269-283). Baltimore: Brookes.
- Deitz, J., Swinth, Y., & White, O. (2002). Powered mobility and preschoolers with complex developmental delays. *American Journal of Occupational Therapy*, 56, 86-96.
- Denzin, N. K., & Lincoln, Y. S. (1994). *Handbook of qualitative research*. Thousand Oaks, CA: Sage.

- Denzin, N. K., & Lincoln, Y. S. (1998). *Strategies of qualitative inquiry*. Thousand Oaks, CA: Sage.
- deVilliers, P. A., & deVilliers, J.G. (1979). *Early language*. Cambridge: Harvard University Press.
- Dillman, D. A. (2000). *Mail and Internet surveys* (2nd ed.). New York: John Wiley & Sons.
- Downing, J. E. (2005). *Teaching literacy to students with significant disabilities*. Thousand Oaks, CA: Sage.
- Ehri, L. C. (1987). Learning to read and spell words. *Journal of Reading Behavior*, 19(1), 5-31.
- Ehri, L. C. (1997). Sight word learning in normal readers and dyslexics. In B. A. Blachman (Ed.), *Foundations of Reading Acquisition and Dyslexia*. Mahwah, NJ: Lawrence Erlbaum.
- Ehri, L. C. (1998). Word reading by sight and by analogy in beginning readers. In C. Hulme & R. M. Joshi (Eds.), *Reading and spelling: Development and disorders* (pp. 87-111). Mahwah, NJ: Erlbaum.
- Ehri, L. C., & McCormick, S. (1998). Phases of word learning: Implications for instruction with delayed and disabled readers. *Reading & Writing Quarterly: Overcoming Learning Difficulties*, 14, 135-163.
- Ehri, L. C., Nunes, S. R., Stahl, S. A., & Willows, D. M. (2001). Systematic phonics instruction helps students learn to read: Evidence from the National Reading Panel's Meta-Analysis. *Review of Educational Research*, 71(3), 393-447.
- Eisenhart, M. A., & Howe, K. R. (1992). Validity in qualitative research. In M. D. LeCompte, W. L. Millroy & J. Preissle (Eds.), *Handbook of qualitative research in education* (pp. 643-680). San Diego: Academic Press.
- Eisner, E. W. (1991). *The enlightened eye: Qualitative inquiry and the enhancement of educational practice*. New York: Macmillan.
- Erickson, F. (1986). Qualitative methods in research on teaching. In M. Wittrock (Ed.), *Handbook of research on teaching* (pp. 119-145). New York: McMillan.
- Erickson, K. A. (2000). All children are ready to learn: An emergent versus readiness perspective in early literacy assessment. *Seminars in Speech and Language*, 21(3), 193-203.
- Erickson, K. A., & Koppenhaver, D. A. (1995). Developing a literacy program for children with severe disabilities. *The Reading Teacher*, 48, 676-684.
- Erickson, K. A., Koppenhaver, D. A., Yoder, D. E., & Nance, J. (1997). Integrated communication and literacy instruction for a child with multiple disabilities. *Focus on Autism and Other Developmental Disabilities*, 12(3), 142-150.

- Ferguson, P. M., Ferguson, D. L., & Taylor, S. J. (1992). *Interpreting disability*. New York: Teachers College Press.
- Foley, B. (1993). The development of literacy in individuals with severe congenital speech and motor impairments. *Topics in Language Disorders, 13*(2), 16-32.
- Foley, B. (2003). Developing augmentative and alternative communication (AAC) and literacy interventions in a supported employment setting. *Topics in Language Disorders, 23*(4), 325-343.
- Foley, B. E., & Pollatsek, A. (1999). Phonological processing and reading abilities in adolescents and adults with severe congenital speech impairments. *Augmentative and Alternative Communication, 15*, 156-173.
- Foorman, B., Francis, D., Fletcher, D., Schatschneider, C., & Mehta, A. (1998). The role of instruction in learning to read. *Journal of Educational Psychology, 90*, 39-47.
- Fried-Oken, M., & Bersani, H. A. (Eds.). (2000). *Speaking up and spelling it out: Personal essays on augmentative and alternative communication*. Baltimore: Brookes.
- Friend, M., & Cook, L. (1996). *Interactions: Collaboration skills for school professionals* (2nd ed.). White Plains: Longman.
- Gathercole, S. E., & Baddeley, A. D. (1990). Phonological memory deficits in language disordered children: Is there a causal connection? *Journal of Memory and Language, 29*, 336-360.
- Geertz, C. (1973). Thick description: Toward an interpretative theory of culture. In *The interpretation of cultures* (pp. 3-30). New York: Basic Books.
- Gersten, R., Fuchs, L. S., Coyne, M., Greenwood, C., & Innocenti, M. S. (2005). Quality indicators for group experimental and quasi-experimental research in special education. *Exceptional Children, 71*(2).
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory*. Chicago: Adline.
- Goldbart, J., & Marshall, J. (2004). "Pushes and pulls" on the parents of children who use AAC. *Augmentative and Alternative Communication, 20*(4), 194-208.
- Goossens, C. A. (1989). Aided communication intervention before assessment: A case study of a child with cerebral palsy. *Augmentative and Alternative Communication, 5*, 14-26.
- Gopnik, A., Meltzoff, A. N., & Kuhl, P. K. (1999). *The scientist in the crib: Minds, brains, and how children learn*. New York: William Morrow.
- Gough, P. B., & Hillinger, M. L. (1980). Learning to read: An unnatural act. *Bulletin of the Orton Society, 30*, 179-196.

- Griffith, P. L., & Olson, M. W. (1992). Phonemic awareness helps beginning readers break the code. *The Reading Teacher*, 45(7), 516-523.
- Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In *Handbook of qualitative research* (pp. 105-117). Thousand Oaks, CA: Sage.
- Hammersley, M., & Atkinson, P. (1995). *Ethnography: Principles in practice* (2nd ed.). New York: Routledge.
- Hanson, V. L. (1989). Phonology and reading: Evidence from profoundly deaf readers. In D. Shankweiler & I. Y. Liberman (Eds.), *Phonology and reading disability: Solving the reading puzzle*. Ann Arbor: University of Michigan.
- Hanson, V. L., Goodell, E. W., & Perfetti, C. A. (1991). Tongue-twister effects in the silent reading of hearing and deaf college students. *Journal of Memory and Language*, 30, 319-330.
- Harper, D. (1992). Small N's and community case studies. In C. C. Ragin & H. S. Becker (Eds.), *What is a case? Exploring the foundations of social inquiry*. Cambridge: Cambridge University Press.
- Hart, B., & Risley, T. R. (1995). *Meaningful differences*. Baltimore: Brookes.
- Hart, B., & Risley, T. R. (1999). *The social world of children learning to talk*. Baltimore: Brookes.
- Hasselbring, T. S., & Glaser, C. H. (2000). Use of computer technology to help students with special needs. *Future of Children*, 10(2), 102-122.
- Heath, S. B. (1982). What no bedtime story means: Narrative skills at home and school. *Language in Society*, 11, 49-76.
- Heller, K. W., Fredrick, L. D., & Diggs, C. A. (1999). Teaching reading to students with severe speech and physical impairments using the Nonverbal Reading Approach. *Physical Disabilities: Education and Related Services*, 18(1), 3-34.
- Heller, K. W., Fredrick, L. D., Tumlin, J., & Brineman, D. G. (2002). Teaching decoding for generalization using the Nonverbal Reading Approach. *Journal of Developmental and Physical Disabilities*, 14(1), 19-35.
- Holloway, R. E. (1996). Diffusion and adoption of educational technology: A critique of research design. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 1107-1133). New York: Macmillan.
- Hoover, W., & Gough, P. B. (1990). The simple view of reading. *Reading and Writing: An Interdisciplinary Journal*, 2, 127-160.

- Huberman, A. M., & Miles, M. B. (1994). Data management and analysis methods. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 428-445). Thousand Oaks, CA: Sage.
- Hulme, C., & Joshi, R. M. (Eds.). (1998). *Reading and spelling: Development and disorders*. Mahwah, N.J.: Erlbaum.
- Inhelder, B. (1980). Language and knowledge in a constructivist framework. In M. Piattelli-Palmarini (Ed.), *Language & learning: The debate between Jean Piaget and Noam Chomsky*. Cambridge, MA: Harvard University Press.
- Isakson, C. L. (2005). *Factors that impact literacy development in three young children who use AAC*. Poster presentation at the CSUN Conference: Technology And Persons With Disabilities, Los Angeles.
- Jenkins, J. R., Fuchs, L. S., van den Broek, P., Espin, C., & Deno, S. L. (2003). Sources of individual differences in reading comprehension and reading fluency. *Journal of Educational Psychology, 95*(4), 719-729.
- Jenkins, J. R., & O'Connor, R. E. (2002). Early identification and intervention for young children with reading/learning disabilities. In R. Bradley, L. Danielson & D. P. Hallahan (Eds.), *Identification of Learning Disabilities: Research to Practice* (pp. 99-149). Mahwah, NJ: Lawrence Erlbaum Associates.
- Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first through fourth grades. *Journal of Educational Psychology, 80*(4), 437-447.
- Juel, C. (1998). What kind of one-on-one tutoring helps a poor reader? In C. Hulme & R. M. Joshi (Eds.), *Reading and spelling: Development and disorders* (pp. 449-472). Mahwah, NJ: Erlbaum.
- Juel, C., & Minden-Cupp, C. (1998). *Learning to read words: Linguistic units and strategies*. (Center for the Improvement of Early Reading Achievement No. #1-008). Ann Arbor: University of Michigan.
- Kazdin, A. E. (1982). *Single-case research Designs: Methods for clinical and applied settings*. New York: Oxford University Press.
- Kelford-Smith, A., Thurston, S., Light, J., Parnes, P., & O'Keefe, B. (1989). The form and use of written communication produced by physically disabled individuals using microcomputers. *Augmentative and Alternative Communication, 5*, 115-124.
- Kent-Walsh, J. E., & Light, J. (2003). General education teachers' experiences with inclusion of students who use augmentative and alternative communication. *Augmentative and Alternative Communication, 19*(2), 104-124.
- Kermoian, R. (1998). Locomotor experience facilitates psychological functioning: Implications for assistive mobility for young children. In D. B. Gray, L. A.

- Quatrano & M. L. Lieberman (Eds.), *Designing and using assistive technology: The human perspective*. Baltimore: Brookes.
- Kinsley, T. C., & Langone, J. (1995). Applications of technology for infants, toddlers, and preschoolers with disabilities. *Journal of Special Education Technology, 12*(4), 312-324.
- Kliewer, C., & Biklen, D. (2001). "School's not really a place for reading": A research synthesis of the literate lives of students with severe disabilities. *The Journal of the Association for Persons with Severe Handicaps, 26*(1), 1-12.
- Koppenhaver, D. A. (2000). Literacy in AAC: What should be written on the envelope we push? *Augmentative and Alternative Communication, 16*, 270-279.
- Koppenhaver, D. A., & Erickson, K. A. (2003). Natural emergent literacy supports for preschoolers with autism and severe communication impairments. *Topics in Language Disorders, 23*(4), 283-292.
- Koppenhaver, D. A., Evans, D., & Yoder, D. E. (1991). Childhood reading and writing experiences of literate adults with severe speech and motor impairments. *Augmentative and Alternative Communication, 7*, 20-33.
- Koppenhaver, D. A., & Pierce, P. (1994). *Written language development research in AAC*. Paper presented at the ISAAC Research Symposium, Kerkrade, The Netherlands.
- Koppenhaver, D. A., Pierce, P. L., Steelman, J. D., & Yoder, D. E. (1995). Contexts of early literacy intervention for children with developmental disabilities. In M. E. Fey, J. Windsor & S. F. Warren (Eds.), *Language intervention: Preschool through the elementary years* (pp. 241-274). Baltimore: Paul Brookes.
- Koppenhaver, D. A., & Yoder, D. E. (1992). Literacy issues in persons with severe speech and physical impairments. In R. Gaylord-Ross (Ed.), *Issues and research in special education* (Vol. 2, pp. 156-201). New York: Teachers College Press.
- Koppenhaver, D. A., & Yoder, D. E. (1993). Classroom literacy instruction for children with severe speech and physical impairments (SSPI): What is and what might be. *Topics in Language Disorders, 13*(2), 1-15.
- Korpi, M. (1988). *Making conceptual connections* (pp. 41-56). Unpublished doctoral dissertation, Stanford University, Palo Alto, CA.
- LaBarge, D., & Samuels, S. J. (1974). Toward a theory of automatic information processing in reading. *Cognitive Psychology, 6*, 293-323.
- Larrivee, L. S., & Catts, H. W. (1999). Early reading achievement in children with expressive phonological disorders. *American Journal of Speech-Language Pathology, 8*, 118-128.

- Liberman, I. Y., Shankweiler, D., & Liberman, A. M. (1989). The alphabetic principal and learning to read. In D. Shankweiler & I. Y. Liberman (Eds.), *Phonology and reading disability: Solving the reading puzzle*. Ann Arbor: University of Michigan.
- Light, J. (1993). Teaching automatic linear scanning for computer access: A case study of a preschooler with severe physical and communication disabilities. *Journal of Special Education Technology, 12*, 125-134.
- Light, J., Binger, C., & Kelford-Smith, A. (1994). Story reading interactions between preschoolers who use AAC and their mothers. *Augmentative and Alternative Communication, 10*, 255-268.
- Light, J., & Drager, K. (2002). Improving the design of augmentative and alternative technologies for young children. *Assistive Technology, 14*, 17-32.
- Light, J., & Kelford-Smith, A. (1993). Home literacy experiences of preschoolers who use AAC systems and of their nondisabled peers. *Augmentative and Alternative Communication, 9*(1), 10-25.
- Light, J., & McNaughton, D. B. (1993). Literacy and augmentative and alternative communication (AAC): The expectations and priorities of parents and teachers. *Topics in Language Disorders, 13*(2), 33-46.
- Light, J., & Lindsay, P. (1991). Cognitive science and augmentative and alternative communication. *Augmentative and Alternative Communication, 7*, 186-203.
- Lincoln, Y. S. (2001). Varieties of validity: Quality in qualitative research. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research* (Vol. 15, pp. 25-72). New York: Agathon.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills: Sage.
- Lindamood, P. C., Bell, N., & Lindamood, P. (1992). Issues in phonological awareness assessment. *Annals of Dyslexia, 42*, 242-259.
- Lundberg, I., Frost, J., & Petersen, O. (1988). Effects of an extensive program for stimulating phonological awareness in preschool children. *Reading Research Quarterly, 23*, 263-284.
- MacKay, D. G. (1992). Constraints on theories of inner speech. In D. Reisberg (Ed.), *Auditory Imagery*. Hillsdale, NJ: Earlbaum.
- Maclean, M., Bryant, P., & Bradley, L. (1988). Rhymes, nursery rhymes, and reading in early childhood. In K. E. Stanovich (Ed.), *Children's reading and the development of phonological awareness*. (pp. 11-37). Detroit: Wayne State University Press.
- Marvin, C. (1994). Home literacy experiences of preschool children with single and multiple disabilities. *Topics in Early Childhood Special Education, 14*, 436-454.

- Marvin, C., & Mirenda, P. (1993). Home literacy experiences of preschoolers enrolled in Head Start and special education programs. *Journal of Early Intervention, 17*(4), 351-367.
- McCutchen, D., Abbott, R. D., Green, L. B., Beretvas, S. N., Cox, S., Potter, N. S., et al. (2002). Beginning literacy: Links among teacher knowledge, teacher practice, and student learning. *Journal of Learning Disabilities, 35*(1), 69-86.
- McCutchen, D., & Berninger, V. W. (1999). Those who know, teach well: Helping teachers master literacy-related subject-matter knowledge. *Learning Disabilities Research & Practice, 14*(4), 215-226.
- Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass.
- Mike, D. (1995). Literacy and cerebral palsy: Factors influencing literacy learning in a self-contained setting. *Journal of Reading Behavior, 27*, 627-642.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis* (2nd ed.). Thousand Oaks, CA: Sage.
- Millar, D. C., Light, J., & McNaughton, D. B. (2004). The effect of direct instruction and writer's workshop on the early writing skills of children who use augmentative and alternative communication. *Augmentative and Alternative Communication, 20*(3), 164 - 178.
- Mirenda, P. (1999). Augmentative and alternative communication techniques. In J. E. Downing (Ed.), *Teaching communication skills to students with severe disabilities* (pp. 119-138). Baltimore: Brookes.
- Mirenda, P. (2003). "He's not really a reader...": Perspectives on supporting literacy development in individuals with autism. *Topics in Language Disorders, 23*(4), 271-282.
- Mirenda, P., & Erickson, K. A. (2000). Augmentative communication and literacy. In A. M. Wetherby & B. M. Prizant (Eds.), *Autism spectrum disorders: A transactional developmental perspective* (pp. 333-368). Baltimore: Paul H. Brookes.
- Morais, J. (1991). Constraints on the development of phonemic awareness. In S. A. Brady & D. P. Shankweiler (Eds.), *Phonological processes in literacy* (pp. 5-28). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Morais, J., Luz, C., Jesus, A., & Bertelson, P. (1979). Does awareness of speech as a sequence of phones arise spontaneously? *Cognition, 7*, 323-331.
- Morris, D. (1992). Concept of word: A pivotal understanding in the learning-to-read process. In S. Templeton & D. R. Bear (Eds.), *Development of orthographic knowledge and the foundations of literacy*. Hillsdale, NJ: Lawrence Erlbaum.

- Morris, D., Bloodgood, J. W., Lomax, R. G., & Perney, J. (2003). Developmental steps in learning to read: A longitudinal study in kindergarten and first grade. *Reading Research Quarterly, 38*(3), 302-328.
- Morris, R. D., Shaywitz, S. E., Shankweiler, D. P., Katz, L., Stuebing, K. K., Fletcher, J. M., Lyon, G. R., Francis, D. J., & Shaywitz, B. A. (1998). Subtypes of reading disability: Variability around a phonological core. *Journal of Educational Psychology, 90*, 347-373.
- Muhr, T. (2000). Atlas.ti (Version 4.2) [Computer Software]. Berlin: Scientific Software.
- National Reading Panel. (2000). *Report of the National Reading Panel. Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction*. Retrieved March 10, 2004, from <http://www.nichd.nih.gov/publications/nrp/smallbook.htm>
- Nelson, N. W. (1998). *Childhood language disorders in context: Infancy through adolescence*. Boston: Allyn & Bacon.
- Nolan, C. (1987). *Under the eye of the clock: The life story of Christopher Nolan*. New York: St. Martin's Press.
- Nolen, S. B. (2001). Constructing literacy in the kindergarten: Task structure, collaboration, and motivation. *Cognition and Instruction, 19*(1), 95-142.
- O'Connor, R. E. (2000). Increasing the intensity of intervention in kindergarten and first grade. *Learning Disabilities Research & Practice, 15*(1), 43-54.
- O'Connor, R. E., & Bell, K. M. (2004). Teaching students with reading disability to read words. In C. A. Stone, E. R. Silliman, B. J. Ehren & K. Apel (Eds.), *Handbook of language and literacy* (pp. 481-498). New York: Guilford Press.
- O'Connor, R. E., & Jenkins, J. R. (1999). Prediction of reading disabilities in kindergarten and first grade. *Scientific Studies of Reading, 3*(2), 159-197.
- Odom, S. A., Brantlinger, E., Gersten, R., Horner, R. H., Thompson, B., & Harris, K. R. (2005). Research in special education: Scientific methods and evidence-based practices. *Exceptional Children, 71*(2), 137-148.
- Olson, R. K., Wise, B., Ring, J., & Johnson, M. (1997). Computer-based remedial training in phoneme awareness and phonological decoding: Effects on the post-training development of word recognition. *Scientific Studies of Reading, 1*(3), 235-253.
- Ogletree, B. T., Bull, J., Drew, R., & Lunnen, K. Y. (2001). Team-based service delivery for students with disabilities: Practice options and guidelines for success. *Intervention in School and Clinic, 36*(3), 138-145.

- Palmer, D. S., Fuller, K., Arora, T., & Nelson, M. (2001). Taking sides: Parent views on inclusion for their children with severe disabilities. *Exceptional Children*, 67(4), 467-484.
- Paradice, R., & Adewusi, A. (2002). 'It's a continuous fight isn't it?': Parents' views of the educational provision for children with speech and language difficulties. *Child Language Teaching and Therapy*, 18(3), 257-288.
- Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Perfetti, C. A. (1985). The evidence of reading ability and verbal efficiency. In *Reading Ability* (pp. 123-154). New York: Oxford.
- Peshkin, A. (1988). Understanding complexity: A gift of qualitative inquiry. *Anthropology & Education Quarterly*, 19(4), 416-424.
- Peshkin, A. (2000). The nature of interpretation in qualitative research. *Educational Researcher*, 29(9), 5-9.
- Piaget, J. (1926). *Language and thought of the child* (M. Warden, Trans.). New York: Harcourt Brace.
- Piaget, J. (1983). Dialogue III: Jean Piaget's views on the psychology of language and thought. In R. W. Rieber (Ed.), *Dialogues on the psychology of language and thought: Conversations with Noam Chomsky, Charles Osgood, Jean Piaget, Ulric Neisser, and Marcel Kinsbourne*. New York: Plenum Press.
- Pierce, P., & McWilliam, P. (1993). Emerging literacy and children with severe speech and physical impairments (SSPI): Issues and possible intervention strategies. *Topics in Language Disorders*, 13(2), 47-57.
- Porter, A. C. (1997). Comparative experiments in educational research. In R. M. Jaeger (Ed.), *Complementary methods for research in education* (2nd ed., pp. 523-547). Washington, D.C.: American Educational Research Association.
- Portin, B. (2002). [Classroom communications.] *Qualitative Methods of Research*: University of Washington.
- Pressley, M., Allington, R. L., Wharton-McDonald, R., Block, C. C., & Morrow, L. M. (2001). *Learning to read: Lessons from exemplary first-grade classrooms*. New York: Guilford Press.
- Pugach, M. (2001). The stories we choose to tell: Fulfilling the promise of qualitative research for special education. *Exceptional Children*, 67(4), 439-453.
- Read, C. (1971). Pre-school children's knowledge of English phonology. *Harvard Educational Review*, 41(1), 1-36.

- Reason, P. (1994). Three approaches to participative inquiry. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 324-339). Thousand Oaks, CA: Sage.
- Richards, T. J., & Richards, L. (1994). Using computers in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 445-462). Thousand Oaks, CA: Sage.
- Richardson, L. (1994). Writing: A method of inquiry. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 516-529). Thousand Oaks, CA: Sage.
- Robbins, C., & Ehri, L. C. (1994). Reading storybooks to kindergartners helps them learn new vocabulary words. *Journal of Educational Psychology, 86*(1), 54-64.
- Roberts, B. (1992). The evolution of the young child's concept of word as a unit of spoken and written language. *Reading Research Quarterly, 27*(2), 125-128.
- Robinson, R. (1995). Qualitative research: A case for case studies. In G. Anglin (Ed.), *Instructional technology past, present, and future*. Englewood, CO: Libraries Unlimited.
- Romski, M. A., Sevcik, R. A., Hyatt, A. M., & Cheslock, M. (2002). A continuum of AAC language intervention strategies for beginning communicators. In J. Reichle, D. R. Beukelman & J. Light (Eds.), *Exemplary practices for beginning communicators: Implications for AAC*. Baltimore: Brookes.
- Roth, F. P., Troia, G. A., Worthington, C. K., & Dow, K. A. (2002). Promoting awareness of sounds in speech: An initial report of an early intervention program for children with speech and language impairments. *Applied Psycholinguistics, 23*, 535-565.
- Samuels, S. J. (1979). The method of repeated reading. *The Reading Teacher, 32*, 403-408.
- Scarborough, H. S. (1998). Predicting the future achievement of second graders with reading disabilities: Contributions of phonemic awareness, verbal memory, rapid naming, and IQ. *Annals of Dyslexia, 48*, 115-136.
- Schieffelin, B. B., & Cochran-Smith, M. (1984). Learning to read culturally: Literacy before schooling. In H. Goelman, A. Oberg & F. Smith (Eds.), *Awakening to literacy* (pp. 3-23). Portsmouth, NH: Heinemann.
- Scribner, S., & Cole, M. (1988). Unpackaging literacy. In E. R. Kintgen, B. M. Kroll & M. Rose (Eds.), *Perspectives on Literacy*. Carbondale: Southern Illinois University Press.
- Share, D. L. (1999). Phonological recoding and orthographic learning: A direct test of the self-teaching hypothesis. *Journal of Experimental Child Psychology, 72*, 95-129.

- Share, D. L. (2004). Language impairment at school entry and later reading disability: Connections at lexical versus supralexical levels of reading. *Scientific Studies of Reading*, 8(1), 87-110.
- Share, D. L., & Gur, T. (1999). How reading begins: A study of preschoolers' print identification strategies. *Cognition and Instruction*, 17, 177-213.
- Shavelson, R. J., & Towne, L. (2002). *Scientific research in education*. Retrieved May 5, 2005, from <http://www.nap.edu/catalog/10236.html>
- Sheffield, B. B. (1991). The structured flexibility of Orton-Gillingham. *Annals of Dyslexia*, 41, 41-54.
- Shulman, L. S. (1997). Disciplines of inquiry in educational research: A new overview. In R. M. Jaeger (Ed.), *Contemporary Methods for Research in Education* (pp. 3-31). Washington, D. C.: American Educational Research Association.
- Sienkiewicz-Mercer, R., & Kaplan, S. B. (1989). *I raise my eyes to say yes*. West Hartford: Whole Health Books.
- Smith, C. R. (2001). Click and turn the page: An exploration of multiple storybook literacy. *Reading research quarterly*, 36(2), 152-183.
- Smith, D. J. (1992). Suabvocalization and auditory imagery: Interactions between the inner ear and inner voice. In D. Reisberg (Ed.), *Auditory Imagery* (pp. 95-119). Hillsdale, NJ: Earlbaum.
- Smith, M. M. (1989). Reading without speech: A study of children with cerebral palsy. *The Irish Journal of Psychology*, 10, 601-614.
- Smith, M. M. (1992). Reading abilities of nonspeaking students: Two case studies. *Augmentative and Alternative Communication*, 8, 57-66.
- Smith, M. M. (2001). Simply a speech impairment? Literacy challenges for individuals with severe congenital speech impairments. *International Journal of Disability, Development and Education*, 48(4), 331-353.
- Smith, M. M. (2005). *Literacy and augmentative and alternative communication*. Burlington, MA: Elsevier.
- Snowling, M. J. (2000). Language and literacy skills: Who is at risk and why? In D. V. M. Bishop & L. B. Leonard (Eds.), *Speech and language impairments in children: Causes, characteristics, intervention and outcome* (pp. 245-259). Philadelphia: Taylor & Francis.
- Spear-Swerling, L., & Sternberg, R. J. (1993). The road not taken: An integrative theoretical model of reading disability. *Journal of Learning Disabilities*, 27(2), 91-103.
- Spradley, J. P. (1979). *The ethnographic interview*. New York: Holt, Rinehart, & Winston.

- Spradley, J. P. (1980). *Participant observation*. Fort Worth, TX: Harcourt Brace Jovanovich.
- Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.
- Stake, R. E. (1998). Case studies. In N. K. Denzin & Y. S. Lincoln (Eds.), *Strategies of qualitative inquiry* (pp. 86-109). Thousand Oaks, CA: Sage Publications.
- Stanovich, K. E. (1980). Toward an interactive compensatory model of individual differences in the development of reading fluency. *Reading Research Quarterly, 16*, 32-71.
- Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly, 21*, 360-406.
- Stanovich, K. E., & Cunningham, A. E. (1993). Where does knowledge come from? Specific associations between print exposure and information acquisition. *Journal of Educational Psychology, 85*, 211-229.
- Stanovich, K. E., Cunningham, A. E., & Cramer, B. B. (1984). Assessing phonological awareness in kindergarten children: Issues of task comparability. *Journal of Experimental Child Psychology, 38*, 175-190.
- Stelman, J., Pierce, P., & Koppenhaver, D. A. (1993). The role of computers in promoting literacy in children with severe speech and physical impairments (SSPI). *Topics in Language Disorders, 13*(2), 76-88.
- Stone, J. C. (2003). Unpacking the social imaginary of literacy education: A case study. *English Education, 26*(1), 35-55.
- Stough, L. M., & Palmer, D. H. (2003). Special thinking in special settings: A qualitative study of expert special educators. *The Journal of Special Education, 36*(4), 206-222.
- Strauss, A. L., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Thousand Oaks, CA: Sage.
- Sturm, J. M. (2002). Enhancing literacy development through AAC technologies. *Assistive Technology, 14*, 71-80.
- Sturm, J. M. (2004). Augmentative and alternative communication, language, and literacy. *Topics in Language Disorders, 24*(1), 76-91.
- Sullivan, M. W., & Lewis, M. (1993). Contingency, means-end skills, and the use of technology in infant intervention. *Infants and Young Children, 5*(4), 58-77.
- Sullivan, M. W., & Lewis, M. (2000). Assistive technology for the very young: Creating responsive environments. *Infants and Young Children, 12*(4), 34-52.
- Sulzby, E. (1988). A study of children's early reading development. In A. D. Pellegrini (Ed.), *Psychological bases for early education* (pp. 39-75). New York: John Wiley & Sons.

- Sulzby, E., & Teale, W. (1991). Emergent literacy. In R. Barr, M. L. Kamil, P. B. Mosenthal & P. D. Pearson (Eds.), *Handbook of reading research* (Vol. 2). New York: Longman.
- Torgesen, J. K. (2000). Individual differences in response to early interventions in reading: The lingering problem of treatment resisters. *Learning Disabilities Research & Practice, 15*(1), 55-64.
- Torgesen, J. K., & Wagner, R. K. (1998). Alternative diagnostic approaches for specific developmental reading disabilities. *Learning Disabilities Research & Practice, 13*(4), 220-232.
- Torgesen, J. K., Wagner, R. K., Rashotte, C. A., Rose, E., Lindamood, P., Conway, T., et al. (1999). Preventing reading failure in young children with phonological processing disabilities: Group and individual responses to instruction. *Journal of Educational Psychology, 91*, 579-593.
- Troia, G. A. (1999). Phonological awareness intervention research: A critical review of the experimental methodology. *Reading Research Quarterly, 34*(1), 28-52.
- Troia, G. A. (2004). Phonological processing and its influence on literacy learning. In C. A. Stone, E. R. Silliman, B. J. Ehren & K. Apel (Eds.), *Handbook of language and literacy* (pp. 271-301). New York: Guilford Press.
- Tudge, J., & Rogoff, B. (1989). Peer influences on cognitive development: Piagetian & Vygotskian perspectives. In J. Bruner & M. Bornstein (Eds.), *Interaction in human development*. Hillsdale, NJ: Erlbaum.
- Tunmer, W. E., Herriman, M. L., & Nesdale, A. R. (1988). Metalinguistic abilities and beginning reading. *Reading Research Quarterly, 23*(2), 134-158.
- Tunmer, W. E., & Hoover, W. (1992). Cognitive and linguistic factors in learning to read. In P. B. Gough, L. C. Ehri & R. Treiman (Eds.), *Reading acquisition*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Vandervelden, M. C., & Siegel, L. S. (1999). Phonological processing and literacy in AAC users and students with motor speech impairments. *Augmentative and Alternative Communication, 15*, 191-211.
- Vandervelden, M. C., & Siegel, L. S. (2001). Phonological processing in written word learning: Assessment for children who use augmentative and alternative communication. *Augmentative and Alternative Communication, 17*, 37-51.
- Vaughn, S., Moody, S. W., & Schumm, J. S. (1998). Broken promises: Reading instruction in the resource room. *Exceptional Children, 64*(2), 211-225.
- Vaughn, S., Schumm, J. S., & Sinagub, J. (1996). *Focus group interviews in education and psychology*. Thousand Oaks, CA: Sage.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

- Vygotsky, L. S. (1986). *Thought and language* (A. Kozulin, Trans.). Cambridge, MA: MIT Press. (Original work published 1934)
- Wagner, R. K., Torgesen, J. K., Rashotte, C. A., Hecht, S. A., Barker, T. A., Burgess, S. R., et al. (1997). Changing causal relations between phonological processing abilities and word-level reading as children develop from beginning to fluent readers: A five-year longitudinal study. *Developmental Psychology*, 33(3), 468-479.
- Wertsch, J. V. (1985). *Vygotsky and the social formation of mind*. Cambridge, MA: Cambridge University Press.
- Wiert, L., & Darrah, J. (2002). Changing philosophical perspectives on the management of children with physical disabilities – their effect on the use of powered mobility. *Disability and Rehabilitation*, 24(9), 492-498.
- Wigfield, A., & Guthrie, J. T. (1997). Relations of children's motivation for reading to the amount and breadth of their reading. *Journal of Educational Psychology*, 89, 420-432.
- Willard-Holt, C. (1993, April 12-16). *The school experience for gifted students with cerebral palsy*. Paper presented at the Annual Conference of the American Educational Research Association, Atlanta, GA.
- Wise, B. W., Ring, J., & Olson, R. K. (1999). Training phonological awareness with and without explicit attention to articulation. *Journal of Experimental Child Psychology*, 72, 271-304.
- Wise, B. W., Ring, J., & Olson, R. K. (2000). Individual differences in benefits from computer-assisted remedial reading. *Journal of Experimental Child Psychology*, 77, 197-235.
- Wolcott, H. F. (1992). Posturing in qualitative research. In *The Handbook of qualitative research in education* (pp. 3-52). San Diego: Academic Press.
- Wolcott, H. F. (1994). *Transforming qualitative data: Description, analysis, and interpretation*. Thousand Oaks, CA: Sage.
- Wolcott, H. F. (1999). *Ethnography: A way of seeing*. Walnut Creek, CA: Sage.
- Wolcott, H. F. (2001). *Writing up qualitative research*. Thousand Oaks, CA: Sage.
- Wolcott, H. F. (2005). *The art of fieldwork* (2nd ed.). Walnut Creek, CA: Altamira.
- Wolf, S. A., & Heath, S. B. (1995). *The braid of literature: Children's worlds of reading*. Cambridge: Harvard University Press.
- Yin, R. K. (1994). *Case study research: Design and methods* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Yopp, H. K. (1988). The validity and reliability of phonemic awareness tests. *Reading Research Quarterly*, 23, 159-177.

Yopp, H. K. (1995). A test for assessing phonemic awareness in young children. *The Reading Teacher*, 49, 20-29.

APPENDIX A: LIST OF PRIMARY DOCUMENTS

P 1: Year 1, Interview, Grant	P24: Year 2, Observation, Valley View, 6-10-063
P 2: Year 1, Interview, Reynolds	P25: Year 3, Interview, Mom: Angela & Alexa
P 3: Year 1, Interview, Zima	P26: Year 3, Interview, Mom: Haley
P 4: Year 1, Observation, Valley View, 4-03-02	P27: Year 3, Interview, Zima
P 5: Year 1, Observation, Valley View, 3-29-02	P28: Year 3, Interview, Zima
P 6: Year 1, Observation, Valley View, 3-06-02	P29: Year 3, Interview, Parker
P 7: Year 1, Observation, Valley View, 5-01-02	P30: Year 3, Interview, Matthews
P 8: Year 1, Observation, Valley View, 5-02-02	P31: Year 3, Observation, Birch Bay, 1-21-2004
P 9: Year 1, Observation, Valley View, 4-02-02	P32: Year 3, Observation, Birch Bay, 2-11-2004
P10: Year 1, Observation, Valley View, 4-29-02	P33: Year 3, Observation, Birch Bay, 2-14-2004
P11: Year 1, Observation, Valley View, 4-05-02	P34: Year 3, Observation, Birch Bay, 2-03-2004
P12: Year 2, Interview, Wood	P35: Year 3, Observation, Birch Bay, 3-12-2005
P13: Year 2, Interview, Anderson	P36: Year 3, Observation, Birch Bay, 3-22-04
P14: Year 2, Interview, Grant	P37: Year 3, Observation, Valley View, 4-20-2004
P15: Year 2, Interview, Zima	P38: Year 3, Observation, Valley View, 4-22-2004
P16: Year 2, Interview, Zima	P39: Year 3, Observation, Valley View, 4-28-2004
P17: Year 2, Observation, Laurel Lake, 5-12, 03	P40: Year 3, Observation, Valley View, 5-05-2004
P18: Year 2, Observation, Laurel Lake, 5-13-03	P41: Angela: Records and Artifacts
P19: Year 2, Observation, Laurel Lake, 5-16-03	P42: Alexa: Records and Artifacts
P20: Year 2, Observation, Laurel Lake, 5-22-03	P43: Haley: Records and Artifacts
P21: Year 2, Observation, Laurel Lake, 4-15-03	P44: Year 1, Memos and Notes
P22: Year 2, Observation, Valley View, 6-03-03	P45: Year 2, Memos and Notes
P23: Year 2, Observation, Valley View, 6-11-03	P46: Year 3, Memos and Notes

APPENDIX B: GUIDING QUESTIONS FOR EDUCATOR INTERVIEWS

Questions about the teacher and class

How long have you been teaching?

Have you taught special education or general education? What grades?

How long have you been at this school?

How many students are in the class?

What grade or grades?

How many students in the class receive special education services?

Are there other educators, such as a reading specialist, working with the child on reading?

Follow-up questions from classroom observations

When I observed your class I saw _____, please tell me more about that.

Questions about the child, academically

How well is the child doing academically with grade-level goals?

Does the child enjoy books?

Where is the child in terms of stages of reading acquisition?

What is the child's level of phonological awareness? Phonemic awareness?

Does the child use invented spelling?

How would you describe the child's writing? Does she use a computer?

Would you say she's made progress in learning to read this year?

What aspects of learning to read have been the most challenging for the child?

Have you found particular approaches to support her through that difficulty?

What approaches to reading instruction have been most successful with this child?

Goals and expectations

What are your goals for this child with regard to literacy?

What are your expectations academically for this child this year? In the future?

Questions on reading instruction

What reading curricula do you use?

Have you adapted instruction for this child?

Are you doing anything differently with this child?

What strategies have worked best? What doesn't seem as effective?

How have you addressed writing with this child?

What are some of challenges to teaching reading and writing to a child who uses AAC?

Do you feel you have all the resources and support you need to teach this child?

Do you think this is an appropriate placement for this child?

If you could create the perfect setting for teaching reading, writing, communication, and language skills to young children with speech and motor disabilities, what would that look like?

Questions about characteristics of the child

How would you rate the child on passivity vs. assertiveness?

Determination?

Motivation to learn to read?

Is the child curious? Inquisitive?

Does she demonstrate persistence? Is she a hard worker? Does she give up easily?

How would you describe her attention? memory?

What assessment methods do you use with this child? Is the child difficult to assess?

Questions about home literacy experiences

Do you assign homework? Is it done by this child?

Are the parents supportive of literacy learning?

As far as you know, is the child read to at home?

Does the child have access at home to books and writing materials?

Technology?

Questions about augmentative communication (AC)

How do you incorporate AC in the lessons?

Does the child use AC to communicate in class? Use her voice?

What role does the child's AC device play in teaching the child to read?

What role does the child's AC device play in communication?

What do you see as the relationship between the child's learning to read and learning to communicate? Does the child's literacy abilities support communication?

How is technology used in the classroom to support literacy?

Questions I didn't ask but should have?

Is there anything that I didn't ask about that you think is significant, that I should know?

APPENDIX C: GUIDING QUESTIONS FOR PARENT INTERVIEWS

Follow-up questions in response to the questionnaire

Are there any areas covered in the questionnaire that you would like to ask me about or talk more about?

In your questionnaire responses you stated _____, please tell me more about that.

Reading to the child

Which family members read to your child?

Where and at what time does most reading take place?

What methods of communication does your child use during reading sessions?

Please describe a typical reading session to me.

Child's reading development

Does your child read or pretend to read books by herself?

Does she read to you or other family members?

How well is she able to read at this point?

Are there areas of learning to read that have been particularly challenging for her?

Have you discovered any strategies that are helpful to her when she is having difficulty?

Have you talked with your child's teachers about how to support your child's literacy development?

Goals and expectations

How do you feel about the progress your child is making in learning to read?

What are your goals for your child with regard to literacy?

What are your expectations academically for you child this year? In the future?

Questions about school

Please tell me about your child's school experiences.

How satisfied are you with your child's school placement and experiences?

How does your child feel about school?

What does she enjoy most about school? What does she enjoy least?

Questions about characteristics of the child

What are some of your child's favorite activities?

Does your child like or not like nursery rhymes?

Can she recognize or produce rhyming words?

Is your child curious about learning new things?

How comfortable is your child when she is facing something new to her?

When your child finds a task difficult or challenging, how does she react?

Is your child assertive about making her needs known to you and others?

How important do you think learning to read is to your child?

Communication & Technology

What methods of communication does your child use at home? Please describe to me some of her ways of communicating.

Do you or other family members program her AAC device? Who does?

Is your child involved in programming it?

Please tell me about your child's use of the technology at home.

Final Question

Is there anything that I haven't asked about that you think would help me better understand your child's experiences learning to read and write?

APPENDIX D: QUESTIONNAIRE FOR PARENTS

The Home Literacy Experiences of Young Children who have
Speech and Motor Impairments

Does your child enjoy books and reading activities?

Do you or other family members read to your child?

If so, how old was your child when you first began to read to her?

On average, how often was your child read to at home before she began attending school (pre-school or kindergarten)?

On average, how often is your child read to at home now?

When you or someone in your family reads to your child, do you more often read a new book or When you or a family member reads to your child who usually chooses the book?

When you or someone in your family reads to your child, how much time do you spend during a typical reading session?

When you or a family member reads to your child, do you finger point to the text or point out words in the text?

Does your child own any books?

If so, about how many books does your child own?

What are the names of some of your child's favorite books?

Does your child enjoy writing, printing, and drawing activities?

How often does your child write or draw at home with crayons, chalk, pencils, or markers?

How often does your child write or draw at home with a computer?

How often do you or someone else in your household read at home for pleasure?

Does your child ask you about what you are reading or writing?

Does your child point out print and ask what it says?

Do you read signs, posters, billboards or other environmental print to your child?

Does your child ever read signs, posters, billboards or other environmental print?

Does your child listen to books on tape or CD at home?

Does your child watch videos that have text captioning?

How often does your child use her AAC device at home?

How often does your child use a computer at home?

Does your child use a computer at home to ...

write

draw

play games

access electronic books

communicate

other (please specify) _____

Please place a check next to all the answers that apply.

Does your child use her AAC device at home for ...

communication

writing/composing

other (please specify) _____

Do you or another household member provide reading instruction or tutoring to your child at Does your child receive reading instruction in a setting other than her regular classroom at school or home?

On average, how often does your child watch television?

What TV programs does your child watch?

Does your child play with magnetic letters, letter blocks, or letter games?

Does your child play board games or card games?

If so, what games does she play?

Does your child participate in any of the following activities? *If so, please write on the line how many times in the past 6 months.*

- _____ visit the library
 _____ borrow books from the library
 _____ go to a bookstore
 _____ listen to stories at a library or bookstore

Does your child have her own library card?

Please place a check mark in the left column for any materials listed below that are available in your home. Please place a check mark in the right column below for those materials that your child uses, reads, pretends to read, or plays with. *Please check all answers that apply.*

<u>Materials</u>	<u>Available in Home</u>	<u>Child Uses</u>
newspapers	_____	_____
magazines	_____	_____
children's magazines	_____	_____
children's picture books	_____	_____
other picture books	_____	_____
children's storybooks	_____	_____
nursery rhyme books	_____	_____
children's dictionary	_____	_____
comic books	_____	_____
encyclopedias	_____	_____
catalogs	_____	_____
electronic children's books	_____	_____

VITA

Carole Isakson was born in Brooklyn, New York, grew up in Valley Stream on Long Island, and moved to the west coast of the United States as an adult. She currently lives in Seattle with her husband, Patrick Dayshaw. She is the mother of two adult children.

She received a Bachelor of Science degree in Electronics Engineering Technology from Cogswell College North in 1989. In 1999 she earned a Master of Education degree from the University of Washington in Curriculum and Instruction: Educational Communication and Technology. She earned a Doctor of Philosophy in Education from the University of Washington in 2006.

Carole Isakson worked for the Boeing Company for many years, initially as an electronics technician and later, after completing her baccalaureate degree, as an engineer. She also served as Director of Assistive Technology at RCH Technical Institute in Renton, Washington. While a graduate student at the University of Washington, she taught educational technology classes in the Teacher Education Program. She is currently a Research Consultant with DO-IT (Disabilities, Opportunities, Internetworking, and Technology) at the University of Washington.