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## Effectiveness of Parent Training on Shared Reading Practices in Families with Children who are Deaf and Hard of Hearing

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## ACCEPTANCE

This dissertation, EFFECTIVENESS OF PARENT TRAINING ON SHARED READING PRACTICES IN FAMILIES WITH CHILDREN WHO ARE DEAF AND HARD OF HEARING, by JESSICA PAGE BERGERON, was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the College of Education, Georgia State University.

The Dissertation Advisory Committee and the student's Department Chair, as representatives of the faculty, certify that this dissertation has met all standards of excellence and scholarship as determined by the faculty. The Dean of the College of Education concurs.

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#### PROFESSIONAL SOCIETIES AND ORGANIZATIONS

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## ABSTRACT

### EFFECTIVENESS OF PARENT TRAINING ON SHARED READING PRACTICES IN FAMILIES WITH CHILDREN WHO ARE DEAF AND HARD OF HEARING

by  
Jessica Page Bergeron

The purpose of this study was to examine the effects of parent training on shared reading practices in families of children with hearing loss. This intervention augmented a multifaceted school program in emergent literacy. In a community based format, parents were explicitly taught three shared reading strategies that have evidence to support the growth of language and vocabulary in children who are hearing and children with hearing loss. These strategies include open-ended questions, language expansions, and scaffolding. A multiple-baseline across content (strategies) design examined the relationship between the intervention and changes in parent behavior. Results indicated that the intervention was effective for increasing open-ended questioning, but there was no functional relationship between the intervention and the other two strategies, language expansions and scaffolding. Conclusions suggest replication to determine the effectiveness of this intervention for increasing open-ended questions. Additionally, further research is needed to determine the intensity and duration of training to influence effects on language expansions and scaffolding.

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IN FAMILIES WITH CHILDREN WHO ARE DEAF AND  
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by  
Jessica Page Bergeron

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## ABBREVIATIONS

CI	Cochlear Implant
DHH	Deaf and Hard of Hearing
ESP	<i>Early Speech Perception Test</i>
<i>Foundations</i>	<i>Foundations for Literacy</i>
HLE	Home Literacy Environment
PTA	Pure Tone Average
PPVT	Peabody Picture Vocabulary Test
SimCom	Simultaneous Communication (signed and spoken language)
UNHS	Universal Newborn Hearing Screening
WWC	<i>What Works Clearinghouse</i>
ZPD	Zone of Proximal Development

## CHAPTER 1

### REVIEW OF THE LITERATURE ON PARENT SUPPORT OF EARLY LITERACY IN CHILDREN WHO ARE DEAF AND HARD OF HEARING

Children who are deaf and hard of hearing (DHH) face difficulties in acquiring language (Schorr, Roth, & Fox, 2008) and delayed language contributes to low levels of literacy attainment (Spencer & Marschark, 2010). Even with legislative mandates for earlier identification and intervention in most states (Universal Newborn Hearing Screening, 2010), many children are still at risk for missing crucial years of language development because of lack of access to spoken or signed languages and because they may not acquire their first language until they attend school (Marschark, 2001). These language delays contribute to literacy difficulties in the areas of expressive and receptive vocabulary, syntax, and narrative skills and, later, development of word level skills and reading comprehension (Easterbrooks & Beal-Alvarez, 2013; Kyle & Harris, 2010; Kyle & Harris, 2011; Lederberg, Schick, & Spencer, 2013; Nittrouer, Caldwell, & Holloman, 2012; Vermeulen, van Bon, Schreuder, Knoors, & Snik, 2007). Often, educators of children who are DHH are the child's first contact with language and literacy instruction; thus, past research on literacy development has focused directly on practices used by teachers (Musselman, 2000).

Recent calls for research capitalize on the parents as their child's first teacher using shared reading as a strategy to develop language and emergent literacy skills (Williams, 2012). For hearing children, shared reading is a robust strategy extensively used as a support for early language and literacy development. Research shows positive results in increasing oral language (Mol, Bus, & de Jong, 2009; Reese, Sparks, & Levya, 2010), increasing print knowledge, (Snow, Burns & Griffin, 1998), promoting positive

feelings about books and literacy, (Mol, Bus, & deJong, & Smeets, 2008), and shows effectiveness for children who are at risk for academic failure (Taverne & Sheridan, 1995). For DHH children, one study showed promising results for increases in oral language (Fung, Chow, & McBride-Chang, 2005) and a few studies have linked certain shared reading strategies to word level skills and vocabulary (Aram, Most, & Mayafit, 2006), language development, alphabetic knowledge, longitudinal outcomes in literacy achievement (DesJardin, Ambose, & Eisenberg, 2008), and story vocabulary and retell skills (Robertson, Dow, & Hainzinger, 2006). However, more studies have investigated areas of difficulty with implementing shared reading with DHH children than have looked at the previous skills, particularly in the vast majority DHH children who are born to two hearing parents (92%; Mitchell & Karchmer, 2004) who may have challenges communicating with their children. These areas include: not reading at all (Luetke-Stalman, Hayes, & Nielsen, 1996) perhaps because of the lack of self-efficacy among parents (Gioia, 2001; Plessow-Wolfson & Epstein, 2005), displeasure in taking part in shared reading (Schleper, 1995), and lack of conversation and over-focus on the text (Stobbart & Alant, 2008; Swanwick & Watson, 2005). Mueller and Hurtig (2010) stated,

A common conclusion from the studies [on shared reading with DHH children] . . . is that although parents of deaf or hard of hearing children presumably know of the importance of reading and sharing stories, there is a lack in follow through [and] training and support for these parents is needed. (p. 75)

Attempting to address the difficulties in communication and lack of training, two shared reading intervention studies modified their interventions either slightly by adding picture support and question examples for parents (Fung, Chow, & McBride-Chang, 2005) or extensively by providing interactive e-books for parents and children that actually taught shared reading strategies during the intervention (Mueller & Hurtig,

2010). Both of these studies focused on outcomes of vocabulary in children. Mueller and Hurtig's (2010) study also examined signed vocabulary in parents as an outcome measure. Review of the existing literature revealed no studies investigating changes in parent behaviors as a result of parent training in shared reading strategies for families with DHH children. It is important to isolate strategies that can improve parents' skills in working with their child who is DHH. Strategies from the hearing and DHH literature can be modified carefully and studied so that parents can receive specific information on how to implement these strategies effectively for their DHH children. Although there are no intervention studies examining changes in parent behavior during shared reading (with DHH children), there is existing research that suggests what skills parents need to be effective when reading with their child who is DHH. General strategies include interactive questioning strategies (Aram et al., 2006) and language expansion strategies (DesJardin et al., 2008). Research with hearing children (see Mol et al., 2009, for a review) supports the use of these strategies.

One strategy that is specific to success of building language during shared reading is scaffolding; there is strong support for its success with hearing children (Dieterich, Assel, Swank, Smith, & Landry, 2006; Landry et al., 2012), and with DHH children (DesJardin et al., 2008; Janjua, Woll, & Kyle, 2002; Plessow-Wolfson & Epstein, 2005; Robertson et al., 2006). In addition, scaffolding supports general language development in DHH children (Quittner et al., 2013). In fact, several of these studies suggest that the ability to scaffold can positively or negatively affect language outcomes for DHH children (DesJardin et al., 2008; Quittner et al., 2013). For the purpose of this paper,

scaffolding is defined as a parent's ability to match his or her questioning or conversations to their child's language level of need (DesJardin et al., 2008).

Literature examining shared reading as a practice for DHH children suggests that, while parents understand the importance of shared reading to improve language and literacy, difficulties in implementation of the practice prevent parents from knowing exactly what to do when faced with communication difficulties with their child. General strategies for implementation of shared reading along with information on scaffolding may help parents demonstrate behaviors during shared reading that are consistent with better language and literacy outcomes in DHH children. More research on the use of shared reading is needed to replicate outcomes and expand our knowledge from the one existing intervention study demonstrating that this practice can improve language and literacy skills in DHH children as it does in hearing children.

This review was guided by the following question: What can parents do at home to facilitate language development and emergent literacy in their children who are deaf and hard of hearing? Children develop language naturally by exposure to rich language models in their home environment (Vasilyeva & Waterfall, 2011). Regardless of the modality of the language (sign or spoken language), the opportune time for language development is in the birth to five year period (Dickinson, McCabe, & Essex, 2006; Fernald & Weisleder, 2011). Children who do not have access to natural language in their home environments are at risk for language delays, which in turn can cause a lifetime of underachievement (Hart & Risley, 2005). DHH children, the vast majority of whom are born to hearing parents, need intervention in order to access their home language (Mitchell & Karchmer, 2004; Yoshinaga-Itano, 2003). Intervention includes auditory

interventions, in the form of hearing aids or cochlear implants, or sign language interventions, which are modeled by proficient signers (Niparko, 2010). Without intervention, DHH children will live in a home with a mismatch of language where the child uses one language or modality that is not used by his/her parents or the child cannot access the language of the home because he/she cannot hear it (Spencer & Lederberg, 1997). Once access to a language is ensured, most DHH children have the potential to develop typical levels of language at a typical rate (Lederberg et al., 2013). However, access to language through intervention can be an obstacle for DHH children and their families if they are not identified early enough in the birth to five year period (Marschark, Rhoten, & Fabich, 2007). Even if DHH children are identified and have received intervention early, intervention still requires intensive imparting of knowledge and instruction on effective language facilitation practices; all the more so if the DHH child is identified and in intervention late (Janjua et al., 2002).

Many families do not understand the importance of their role in facilitating language development for their DHH child (Lederberg et al., 2013). Families may have the perception that they are incapable of building language effectively in DHH children or that it is the job of the interventionist or the teacher to build language rather than the job of the parent (Gioia, 2001; Stobbart & Alant, 2008). To help bridge this gap in understanding, parent training is key (Kaiser & Hancock, 2003). Under the Individuals with Disabilities Education Act (IDEA, 1997), parents receive individual intervention services from the child's birth (or as soon as their child is identified). Early intervention often includes parent training on evidence-based practices to facilitate language. However, the challenge with effective intervention in the DHH field is that there is not

yet enough research to support certain strategies and interventions or modifications of existing strategies and interventions. Researchers have begun to investigate the value of building a knowledge-base of effective strategies for DHH children based on practices already being used by hearing children and their families, such as *shared reading* (Williams, 2012). Shared reading is an evidence-based practice that has beneficial outcomes in language development, especially vocabulary, as well as other emergent literacy skills such as phonological awareness and phonics skills (Mol et al., 2009). However, there is a significant difference between a hearing child or Deaf child with Deaf parents, who live in a language-matched home (Spencer & Lederberg, 1997). Their spoken or sign language development requires little or no intervention. DHH children of hearing parents on the other hand, may need substantial intervention to access the language of the home as well as more intentional intervention for the parents on language facilitation (Mueller & Hurtig, 2010). As such, shared reading programs designed for hearing children could be modified for families with DHH children. Research on modifications is sparse and needs more attention. Specifically, information is needed on effective practices for parent training including the types of strategies as well as the delivery model for training, which includes intensity and duration as well as components of instruction. Outcomes from this line of research will provide much needed information on effective strategies and practices for facilitation of language for DHH children (Williams, 2012).

### **Purpose**

The purpose of this review was to examine the research on language and literacy development in DHH children as well as parent training to determine useful strategies by parents to facilitate language through shared reading. In particular, the practice of shared

reading has strong evidence to support its use for language development among hearing children but presents challenges in implementation for DHH children. Specifically, parents of DHH children may feel ill-equipped to implement the strategy effectively while also meeting the individual language needs of their children. As such, in this review I examine effective practices that build language during shared reading in DHH children as well as effective instructional techniques for changing parent behavior in diverse settings.

### **Relation of Language to Literacy in Hearing Children**

Researchers describe literacy as a language related skill (Lederberg et al., 2013), which explains why it is so important to focus on language within the literacy context. Early exposure to literacy begins in infancy and toddlerhood (Snow et al., 1998), when children are acquiring language within the context of their home environments. Language development is the basis of reading, and language measurements of vocabulary, syntax, and comprehension are good predictors of reading achievement (Catts, Fey, Zhang, & Tomblin, 1999; Dickinson, McCabe, Anastasopoulos, Peisner-Feinberg, & Poe, 2003; Kyle & Harris, 2010; Mayberry, del Guidice, & Lieberman, 2011; Nittrouer, Caldwell, & Holloman, 2012; Nittrouer, Caldwell, Lowenstein, Tarr, & Holloman, 2012; Spencer & Oleson, 2008). When young children enter school and begin formal reading instruction, the focus is on developing the mechanics of reading such as phonics and decoding skills, and very little time is spent on language and direct vocabulary instruction (Neuman, 2011). For most children, the mechanics of reading involves activating an already intact spoken language system that has been developed since birth through listening to language in their environments. Word decoding leads to understanding (comprehension) because

meaning of the word is already established in memory (Dickinson et al., 2003; Stanovich, 1986).

However, for other children whose language system is delayed, incomplete, or substantially less developed, there are dramatic consequences for reading development that may not be observable until much later in the child's school career. In a large study of hearing children ( $N = 424$ ), some who were at risk for reading delays, researchers found that language skills contribute to literacy development in important ways, especially in the areas of vocabulary, grammar, and narration. As children age and become more proficient readers, these language skills, or lack thereof, become more pronounced in the development of comprehension (Catts, Fey, & Proctor-Williams, 2000). With a more intense focus on the mechanics of reading in the early grades (*learning to read*) than in the higher grades when children are expected to comprehend and learn from the text (*reading to learn*), language is a stronger predictor of fourth grade reading achievement than it is of second grade reading achievement (Adlof, Catts, & Lee, 2010; Catts et al., 2000). Other studies support these results and show that, for hearing children with milder language impairments, vocabulary delays may not be observable until the fourth grade (Sénéchal, Ouellette & Rodney, 2006; Storch & Whitehurst, 2002). Delayed identification and action for children with language and reading difficulties causes lifelong struggles with achievement (Annie E. Casey Foundation, 2010).

The disparity between children who are successful readers and those who are not may be attributed to an early language foundation. Hart and Risley (1995) conducted an extensive longitudinal study on parent-child talk in 42 families and discovered that children's academic performance in later grades can be attributed to the amount of talk

they heard from birth to age three. There was a 30 million word difference between families from high-income than families from low-income households. In 2011, among fourth-graders who scored below the 25<sup>th</sup> percentile on the National Assessment of Educational Progress in reading, 74% of them were from low-income families (Nation's Report Card, 2011). This may be due to the lack stimulation in early childhood for language. Three quarters of children who fail to read proficiently by third grade will remain poor readers in high school and will display more behavioral and social problems in school than good readers (Annie E. Casey Foundation, 2010) and 2/3<sup>rds</sup> of children in eight grade who are poor readers had limited language proficiency in kindergarten (Catts, Adlof & Weismer, 2006). The National Research Council stated that "A person who is not at least a modestly skilled reader by [third grade] is unlikely to graduate from high school (Snow et al., 1998, p 21)."

### **Relation of Language to Literacy in Children who are DHH**

**Risks associated with language delays.** DHH children are at risk for language delays due to lack of access to a natural language (language acquisition without intervention) in the early years of their lives (Lederberg et al., 2013). Ninety-two percent of DHH children are born to hearing parents (Mitchell & Karchmer, 2004), which creates a language "mismatch" between the parent and the child (Spencer & Lederberg, 1997) where the child is not using the same language or modality to access language as hearing children of hearing parents do (or Deaf children of Deaf parents). For example, some DHH children acquire American Sign Language (ASL) and others may require hearing technology such as hearing aids or cochlear implants (CIs) to access the spoken language in their home. For most families, intervention is necessary create an accessible and

quality (linguistically-rich) language environment, which can help support language development in DHH children. In addition to the accessible language and quality of language input, other factors that influence language outcomes for DHH children are age of identification and intervention and quality of early intervention instruction.

Late age of identification in and of itself is not the critical factor for language development in DHH children, but earlier identification can lower the age a child receives intervention. Without early intervention, children will miss the “optimal” period for which certain cognitive and linguistic abilities develop (Spencer & Marschark, 2010, p. 38). DHH Children who are identified early and in appropriate intervention by six months to one year of age can dramatically reduce their risk of language delays (Yoshinaga-Itano, 2003). DHH Children identified by six months of age performed in the “low average” range on measures of language when compared to the language level of hearing peers (Spencer & Marschark, 2010). This is considerably higher than children who are identified later and do not receive early intervention services.

When a family with a DHH child enters into early intervention services, families may choose (a) audiological interventions through hearing aids or cochlear implants, with auditory development therapy and management, to access spoken language (Niparko et al., 2010), (b) signed language intervention approach (e.g., American Sign Language) which requires proficient signing language models (Spencer & Marschark, 2010), or (c) some combination of a signed or spoken language model (Lederberg et al., 2013). Each one of these interventions takes considerable effort on the part of the parents and the families; research consistently shows positive outcomes connected to family involvement and family language environment (i.e., quality of family talk to and with the

child; Janjua et al., 2002; Niparko et al., 2010; Quittner et al., 2013; Szagun & Stumper, 2012).

However, there is little awareness among families that an optimal language learning environment is one that fits the characteristics of the family and the child. Families also may not be aware that intentional efforts to facilitate language in the home and family involvement are linked to successful outcomes (Lederberg et al., 2013). Less than optimal language environments result in what Spencer and Lederberg (1997) described as a language and modal *mismatch of communication*, which often occurs for DHH children who are attempting to access language in a hearing household. When hearing parents rely only on spoken language with their DHH children, language mismatch and limited access prevent DHH children from engaging in meaningful conversations with parents and others in their household. The result is a poorer language environment that does not compare to the rich language environment of children with matched languages, including hearing children with hearing parents as well as Deaf children of signing Deaf parents. While more than half of DHH children are cognitively capable of developing language at the same rate as their hearing peers, including Deaf children with Deaf parents (Spencer & Lederberg, 1997), DHH children showed delays in their acquisition of language and vocabulary knowledge (Luckner & Cooke, 2010; Spencer & Marschark, 2010).

Development of an appropriate match of language input from parent to child can depend on the quality of intervention services. The Colorado Early Intervention Program (CHIP) incorporated effective intervention practices (Spencer & Marschark, 2010). The CHIP program uses family-centered approaches with a trained professional who works as

a team with the parents and extended family. The professional assesses the child's language progress twice a year and makes data-driven decisions about the child's language-learning environment and makes recommendations accordingly. However, the CHIP program is an exception rather than the norm, and Lederberg and others (2013) noted that, when faced with the choice regarding an optimal language learning approach, parents and professionals consider "their philosophical stance rather than [the] characteristics of an individual child" (Lederberg et al., 2013, p. 16). The implication here is that not all families of DHH children are receiving appropriate early intervention information and services, which prevents optimal language input and language learning.

**Current state of literacy for children who are DHH.** Language acquisition and subsequent literacy outcomes for DHH children are areas of extensive research and study because language contributes significantly to literacy development. Spencer and Marschark (2010) described the critical relationship between language and literacy in the following manner: "The fact that many, if not most, children who are deaf or hard-of-hearing face challenges in acquiring language skills is the primary explanation given for the high rate of academic delays and difficulties" (p. 16). Indeed, research shows that, regardless of modality, DHH children lag behind their hearing peers in reading and/or reading related skills (Easterbrooks, Lederberg, Miller, Bergeron, & Connor, 2008; Geers, 2003; Geers, Tobey, Moog, & Brenner, 2008; Harris, & Terlektsi, 2011; Lederberg et al., 2013; Mayer, 2007). In a national norming sample of DHH children for the Stanford Achievement Test, the median reading comprehension scores for each age group of DHH children ranging from eight to eighteen fell in the Below Basic area (Traxler, 2000). Across time, from 1974 to 2003, these results have persisted (Qi &

Mitchell, 2011). The contribution of language development in DHH children is significant; a meta-analysis of reading studies showed that overall language competence predicted 35% of the variance in the reading ability of DHH children (Mayberry et al., 2011). These authors concluded that, “Deaf readers, like hearing readers, are more likely to become successful readers when they bring a strong language foundation to the reading process” (p. 181). Several studies isolated aspects of language that specifically contributed to literacy development including (a) comprehension, production, verbal reasoning and narrative (Geers, 2003; Pakulski, & Kaderavek, 2001), (b) expressive vocabulary (Easterbrooks et al., 2008; Kyle & Harris, 2010; Mayberry et al., 2011), (c) the interaction between vocabulary and English syntax (Kelly, 1996; Nittrouer, Caldwell, & Holloman, 2012), receptive vocabulary (Johnson & Goswami, 2010), (d) reading comprehension and written word skills (Wu, 2010), and (e) lexical diversity (Dillion & Pisoni, 2006).

**Areas of delay.** Language delays affect literacy development for DHH children in many ways including (a) early experiences of reading in the home (Swanwick & Watson, 2005), (b) development of phonological skills (decoding) (Kyle & Harris, 2010), (c) vocabulary acquisition from text (Connor & Zwolan, 2004; Kelly, 1996; Marschark et al., 2011), and (d) text comprehension (Connor & Zwolan, 2004; Kyle & Harris, 2010). Regarding early experiences in the home, there is a link between the home literacy environment and children’s literacy engagement and interest (Baroody & Diamond, 2012; Sénéchal & Young, 2008). Many parents and their DHH children experience emergent literacy activities as a generally negative experience that is frustrating for both

parents and children (Swanwick & Watson, 2005). More in-depth information regarding the emergent literacy experiences of DHH children will be presented later in the review.

In addition to parent-child frustration with reading, some authors assume that DHH children have delays in reading due to their inability to develop phonologically-based skills to decode (Goldin-Meadow & Mayberry, 2001), an assumption that Mayberry et al. (2011) challenged. Certainly, there is a significant advantage for those children who have “access to the written language’s auditory phonological system” (Lederberg et al., 2013, p. 24). Geers (2006) stated that “the frequently reported low literacy levels among students with severe to profound hearing impairment are, in part, due to the discrepancy between their incomplete spoken language system and the demands of reading a speech-based system” (p. 244; Perfetti & Sandak, 2000). However, auditory access to develop phonologically based skills will not completely eliminate delays in reading (Spencer & Marschark, 2010). Language acquisition is undoubtedly important, and some studies suggest that language contributes to building decoding and other phonologically based skills (Dillon & Pisoni, 2006; Kyle & Harris, 2010). For example, DHH children lack not only the auditory access for mapping sounds to print but also sufficient language to support development of code-related skills (Kyle & Harris, 2010). In their three-year longitudinal study, Kyle and Harris examined 29 DHH children and found that vocabulary was the strongest predictor for reading achievement including word reading skills. Dillon and Pisoni (2006) studied phonological skills in seventy-six children with profound hearing loss using a non-word repetition task that required “immediate and rapid phonological processing of novel phonological patterns” (p. 136). The authors found that children’s vocabulary knowledge was a mediating factor between

the children's nonword repetition and reading skills. The authors concluded that expressive vocabulary "may reflect an important underlying factor in the development of phonological processing . . ." (p. 138). Certainly other studies (Dickinson et al., 2003) with hearing children show parallel results and suggest that deficits in vocabulary contribute to delayed development in phonological skills. The authors noted that it was "semantic and syntactic skills, rather than speech discrimination and articulation skills, that predicted phonological awareness differences" in a study of preschoolers completing phonological awareness tasks (Snow et al., 1998, p. 53). Other researchers (Mayberry et al., 2011) found, in the only study of this nature, that language skills explained 35% of the variance in reading ability, suggesting that, for DHH children, phonological skills develop as a result of the process of learning to read, a finding that is also supported by Kyle and Harris (2010).

Another contributing factor in the literacy delays of DHH children is vocabulary acquisition. Research consistently shows that pre-reading language levels of children transitioning from the *reading to learn* stage (i.e., third or fourth grade) influenced the amount of vocabulary learned over time. Connor and Zwolan (2004) examined 91 children with profound hearing loss who used cochlear implants. Results on two expressive vocabulary measures revealed that larger earlier vocabulary scores had a positive effect on and could predict later vocabulary development. Similarly, Kelly's (1996) study found that adolescents' and college students' ( $N = 424$ ) syntactic competence interacted with vocabulary knowledge. The author concluded that a certain level of syntactic ability is necessary for speakers to use their vocabulary knowledge during reading comprehension tasks, stating that "limited syntactic knowledge . . . may

detract from comprehension indirectly by obstructing the reader's ability to apply stored vocabulary knowledge" (p. 86). deVilliers and Pomerantz (1992) found a link between a DHH child's existing reading skills and his or her ability to learn vocabulary from the text, which suggests that a strong language foundation supports acquisition of vocabulary in written contexts.

Research on hearing children suggests that children who read more than those who do not read often are exposed to more text thus developing better reading skills and larger lexicons, which has been described as *The Matthew Effect*. The term, *Matthew Effect*, was first coined by sociologist Merton (1968) to describe the concept that "the rich get richer and the poor get poorer" and borrowed its meaning from the biblical Gospel of Matthew. Stanovich (1986) was the first to use the term in education in the context of early reading, conjecturing that some children are more proficient readers because they spend more time reading and thus acquire more language and vocabulary from the text. Stanovich stated that "much vocabulary growth probably takes place through the learning of word meanings from context during reading" (p. 364).

Marschark et al. (2011) found results consistent with Stanovich's description when comparing 100 deaf and 100 hearing college students, who demonstrated a relationship between print exposure and academic achievement. Examining college students who are DHH and their ability to acquire knowledge and language from the text is especially important because previous studies suggested that college students who are DHH did not learn vocabulary incidentally "through-the-air" via spoken or signed languages as efficiently as they did through text (Marschark et al., 2009). College students who are DHH actually learned more vocabulary from text and relied more

heavily on text to get information than those who were in a sign language intensive environment, yet their prior exposure to print (*Matthew Effect*) and their ability to learn vocabulary from text efficiently was strongly affected by their existing language skills (Marschark et al., 2011).

The fourth and final area where language development most strongly influences reading is text comprehension. The National Reading Panel (2000) described text comprehension as a reader's ability to "construct meaning representations of the text as they read . . . [and these] representations provided the basis for subsequent use of what was read and understood" (p. 4-39). Connor and Zwolan (2004) examined DHH children and used cochlear implants and found a strong age-at-implantation effect for reading comprehension. The authors concluded that children with stronger pre-implant vocabulary who were implanted younger had stronger reading comprehension outcomes. Kyle and Harris (2010) assessed seven and eight year old DHH children at three month intervals over the course of 12 months and found that earlier vocabulary was predictive of text comprehension skills so children with larger vocabularies made greater gains in reading. These authors suggested, similar to several previous authors and in studies with hearing children, that "weak phonological awareness skills can be compensated by good vocabulary knowledge and language skills" as support for reading comprehension (p. 241). Dickinson et al. (2003) suggested that language skills can mediate poor skills in phonological awareness for reading comprehension. However, a comprehensive literature review of reading comprehension research showed that DHH children lack the language foundation to mediate other areas of weakness and thus improve reading outcomes (Luckner & Handley, 2008). Of note, Luckner and Handley located only three studies of

sufficient scientific merit in which researchers examined vocabulary development related to reading comprehension.

In summary, examining the literature on language skills of DHH children and the influence of language on reading development suggests that vocabulary and language deficits have profound implications for DHH children (Spencer & Marschark, 2010). Taken together, the literature surrounding influences on the language-reading relationship suggest that families need support to develop early language skills in DHH children. Such support might foster development of the strong language foundation needed to ameliorate delays in these key areas of reading development (Spencer & Marschark, 2010).

### **Influence of Early Intervention on Literacy Acquisition**

Early age identification and intervention of DHH children provides great benefits to their communication development (Geers & Hayes, 2010; Spencer & Marschark, 2010; Yoshinaga-Itano, 2003). With the high costs committed to education of DHH (Mauk & White, 1997) and the lifelong outcomes of delayed language and literacy (Spencer & Marschark, 2010), educators, parents, and others influenced public policy to reduce the age of identification. Reducing the age allowed educators to take advantage of the optimal language development period (birth to three years of age) and implement intervention earlier. Legislators implemented Universal Newborn Hearing Screening (UNHS) in all U.S. states and territories (National Center for Hearing Assessment and Management, 2013), and the average age of identification went from a range of two and a half to three years of age to a range of two to three months of age (Houston, Bradham, Munoz, & Guignard, 2011; UNHS, 2010). Improved intervention practices in the past

few decades have resulted in small but promising gains in outcomes for DHH children including (a) significantly improved language acquisition through early identification and immediate support to families afterwards (Yoshinaga-Itano, 2003), (b) recognition of and immersion in language-rich environments of natural languages (e.g., American Sign Language) to promote language development (Meadow-Orlans, Spencer, & Koester, 2004), and (c) improved literacy outcomes for children who use cochlear implants (Geers & Hayes, 2010).

However, even with these positive changes, one particular factor, many factors prevent the majority of the DHH population from benefiting from all of the available and appropriate interventions for consistent and predictive outcomes in literacy development (Lederberg et al., 2013). One factor is that many children are lost to follow-up. For example, although 97% of all newborns are screened before leaving the hospital, an estimated 50% of infants referred from UNHS are not diagnosed nor have received intervention by the target ages of three and six months respectively (Houston et al., 2011). Additionally, as mentioned earlier, quality of intervention is important; yet professionals and parents may consider their own philosophies rather than the individual characteristics of the child when making decisions regarding the best way to access language and create optimal language-learning environments (Lederberg et al., 2013). Spencer and Marschark (2010) agreed: “For too long, practice in education of deaf and hard-of hearing students has been based more closely on beliefs and attitudes than on documented evidence from research or the outcomes of intervention” (p. 25). Another factor is that the number of home births has increased by 29% since 2004, and these children tend not to make it into the system at all (MacDorman, Matthews, & Declercq,

2012). A third factor is that many children immigrate and enter the schools many years after they were born (Heath & Kilpi-Jakonen, 2012), thus missing out on early intervention. Finally, the many children with mild degrees of hearing loss may be missed in UNHS, and thus miss out on early intervention services (Holstrum, Biernath, McKay, & Ross, 2009).

Advances in technology, such as the use of improved digital, programmable hearing aids and cochlear implants, is another area where early identification and intervention is influencing outcomes for DHH children (Lederberg et al., 2013). Improved hearing aid technologies provide tailored, higher quality access to sound through programmable amplification at certain frequencies and better access to speech in noise (Harkins & Bakke, 2011). Cochlear implants are surgically implanted devices designed to directly simulate the auditory nerve and allow the brain to perceive speech sounds, including music (Cochlear Ltd., 2013). Approved by the Food and Drug Administration for children as young as 12 months of age with severe to profound hearing loss, cochlear implants give a child “access to auditory information similar to that received by a child with a hearing loss in the moderate range who uses a hearing aid” (Spencer & Marschark, 2010, p. 21). These technological advances have made acquisition of spoken language more attainable and allow many more DHH children access to language than in the past (Spencer & Marschark, 2010). Several studies demonstrate promising results related to early language including typical levels of expressive and receptive vocabulary and general language abilities (Niparko et al., 2010; Quittner et al., 2013; Schorr, Roth, & Fox, 2008; Schramm, Bohnert, & Keilmann, 2010) and subsequent literacy skills such as phonological awareness (Wu et al., 2011).

Because of the many factors that influence successful outcomes with cochlear implants, such as age of identification and parental involvement, some authors have concluded that “Parents held expectations that early identification and intervention would be sufficient to make their child be like a hearing child, although that expectation is not supported by the data” (Spencer & Marschark, 2010, p. 42). Factors that influence outcomes for children who received cochlear implants include age of implantation (Connor & Zwolan, 2004; Nitttrouer, Caldwell, Lowenstein, et al., 2012; Schorr, Roth, & Fox, 2008; Schramm et al., 2010), quality of preimplant hearing (Niparko et al., 2010), communication mode (Beadle, McKinley, Nikolopoulos, Brough, O’Donoghue, & Archbold, 2005), and socioeconomic status (Connor & Zwolan, 2004; Niparko et al., 2010). Regarding age of implantation, children who are implanted earlier develop listening, language and speech skills as well as phonological based reading skills more readily than children who are implanted later (Connor & Zwolan, 2004; Geers, 2003; Nicholas & Geers, 2004; James, Brinton, Rajput, & Goswami, 2008) Regarding quality of preimplant language, children with higher language prior to the implant will develop language more quickly after implantation (Niparko et al., 2010). Regarding communication mode, children in listening and spoken language settings will more readily acquire listening and spoken language skills (Beadle et al., 2005). Regarding socio-economic status, children from low-income homes have a disadvantage for language development than children in higher income homes (Niparko et al., 2010). Quality of parental input is emerging as having a significant effect for children’s outcomes with cochlear implants. In a study of the language acquisition of 25 children ages six to 42 months who used cochlear implants, (Szagun & Stumper, 2012), certain

properties of maternal behaviors (e.g., mean length of utterance, expansions) promoted faster language growth, leading the authors to conclude that what goes on in the child's language environment in the home is more important than age at implantation in influencing the linguistic progress (Szagun & Stumper, 2012). Other studies support outcome effects as a result of parental input (Niparko et al., 2010; Quittner et al., 2013).

Rapid changes and potential for improvements in interventions for DHH children, coupled with the need for consistency across the population for intervention practices, demand more research to determine components for language and literacy development that contribute to better outcomes (DeRaeve & Lichtert, 2012). Furthermore, there is currently a shift in the focus of intervention and instruction from teacher implemented interventions (Musselman, 2000) to parent implemented interventions (Reese et al., 2010) as a result of the lower age of identification and intervention. In fact, recent calls for research included examinations of interventions and strategies that view parents as their child's first teacher and that are based on effective practices for hearing children (Schirmer, 2001; Schirmer & McGough, 2005; Williams, 2012). Additional studies describing parental interaction and input as a key factor in success are described below (DesJardin et al., 2008; Janjua et al., 2002; Quittner et al., 2013; Szagun & Stumper, 2012).

### **Emergent Literacy Practices in Homes of Typically Developing Children**

Many factors influence literacy development for DHH children, and the changes from early intervention highlight the need to examine the home literacy environment for typical children to determine the predictors and the effects of the home literacy environment (HLE). For typically developing children ages birth to five, studies show

that the emergent literacy interactions in the middle-income HLE include, but are not limited to, book reading between parents and children (*shared reading*), trips to the library, singing and reciting rhymes with children, looking at books independently, as well as opportunities for play around literacy (e.g. creating shopping lists, drawing pictures; Curenton & Justice, 2008; DesJardin & Ambrose, 2010; Mol & Bus, 2011; Reese et al., 2010; Snow et al., 1998). Emergent literacy interactions are not limited to books, however. In culturally diverse and low-income homes, storytelling about personal events is an important literacy component, which can build a narrative foundation for children to build language development and reading comprehension (Reese et al., 2010). Also referred to as *elaborative reminiscing* (Sparks & Reese, 2013; Reese, Layva, Sparks, & Grolnick, 2010), this strategy has been found to increase low-income children's ability to relate narrative elements of stories.

The HLE is commonly measured through the (a) presence of literate activities, (b) report of literacy devices in the home (e.g., books, newspapers, magazines), (c) observation of literacy devices in the home, and (d) testing of parents' familiarity of children's storybooks (Aram & Levin, 2011). Other areas of measurement for HLE include aspects of writing such as experimenting with writing tools, drawing pictures, writing letters and words (Aram & Levin, 2011). Additionally, parent beliefs and behavior about literacy are noted to improve outcomes in reading (Curenton & Justice, 2008; Sénéchal & Young, 2008). In a study of low-income families that examined mothers' beliefs about literacy, authors examined parental beliefs about literacy and mothers' education level (Curenton & Justice, 2008). Children in this study scored higher on measures of print concepts and alphabetic knowledge when their mothers had higher

scores on the parental belief assessment and more education. Several other studies specifically examined parent behavior during shared reading such as pointing to the text, pointing to pictures, describing the pictures, asking questions, and conversations about the story (Cunningham & Zibulsky, 2011; Evans & Saint-Aubin, 2011; Justice & Piasta, 2011) and found that more interaction between the parent and child led to higher literacy-related outcomes for the child. For example, several studies compared interventions asking the adult to specifically reference the print during reading. These literacy outcomes included higher gains on print concepts measures than groups focused on pictures only (Justice, Skibbe, McGinty, Piasta, & Petrill, 2011) as well as higher gains on reading, spelling and comprehension scores two years past print-referenced interventions (Piasta, Justice, McGinty, & Kaderavek, 2012).

The presence of emergent literacy activities in the HLE are strong predictors of school literacy success. The home and family literacy environment has large effects on language outcomes and general cognitive abilities related to receptive and expressive language (National Early Literacy Panel, 2008). The effects are cumulative and persist throughout the child's school career. In a large meta-analysis of 99 studies ( $N = 7,669$ ) examining the effects of print exposure on language development, print exposure explained 12% of the variance in preschoolers and kindergarteners' language development, 13% of the variance in primary school, 19% in middle school, 30% in high school, and 34% at undergraduate and graduate levels (Mol & Bus, 2011). Although it must be considered that variance percentages included measurements of reading time outside of school at each level (not just from the early years), the authors posited that "an early start of shared book reading sets in motion a causal spiral, in which print exposure

stimulates language and reading development, which, in turn, stimulates the quantity of print exposure” (p. 285), described earlier as the *Matthew Effect*.

Of the 99 studies in the meta-analysis on print exposure, the relatively large number of 29 studies ( $N = 2,168$ ) targeting preschool and kindergarten children demonstrate a wide interest and examination of emergent literacy practices in young hearing children (Mol & Bus, 2011). Conversely, for DHH children, there are very few studies examining the HLE or parent interventions related to literacy. First, Williams (1994) described and documented the HLE of three young DHH children for six months to identify whether they developed emergent literacy skills similarly to hearing children. The author described DHH children developing comparable emergent literacy behavior including concepts of print, narrative retells of storybooks, and participating in reading, drawing, and writing similar to hearing children (Williams, 1994; 2004). Next, several studies suggested that hearing parents of DHH children do not display comparable behaviors during emergent literacy activities as families who shared a first language (e.g. behaviors resembling that of hearing parents of hearing children or Deaf parents of Deaf children; Delk & Weidekamp, 2001; DesJardin et al., 2008; Gioia, 2001; Swanwick & Watson, 2005). Additionally, in one study of three families with DHH children that examined HLE and shared reading, the participating parents felt that they did not “develop satisfactory (in their terms) shared reading rituals with their deaf children” (Gioia, 2001, p. 424) because of their children’s language delays. In this case, parents’ indicated feelings of concern, not because they did not share the same language as their child, but because their child’s language delay prevented both from communicating effectively (Gioia, 2001). Finally, a study of 29 hearing parents of DHH children

documenting the HLE demonstrated that parents (93%) overwhelmingly believed that it was primarily the teachers' responsibility to teach their children to read (Stobbart & Alant, 2008), and the author concluded that the parents did not understand the value of parental involvement in reading outcomes for their children.

In summary, several research studies link the HLE, including exposure to print, presence of books, and parent behavior and beliefs, to literacy outcomes in typically developing children (Aram & Levin, 2011; Curenton & Justice, 2008; Mol & Bus, 2011; Reese et al., 2010; Snow et al., 1998). There are very few descriptive studies on the HLE for DHH children. Several studies pointed to potential issues around language delays and language mismatches among families with hearing parents and DHH children (Gioia, 2001; Stobbart & Alant, 2008; Swanwick & Watson, 2005), suggesting that efforts to bridge this mismatch might prove valuable in emergent literacy interventions. When investigating parents' needs for and barriers to learning strategies for developing language and literacy in their DHH children, the research literature on emergent literacy suggests that a sociocultural theoretical model (Stobbart & Alant, 2008) might be an effective way of framing parental practices.

### **Sociocultural Foundation of Emergent Literacy Development**

The sociocultural model draws on a theory of learning proposed by Vygotsky (1978; Bruner, 1996; Lave & Wenger, 1991) and challenges the assumption that literacy should be taught as a system of rules; instead, this perspective highlights the quality of children's interactive encounters with their parents and siblings (Aram & Levin, 2010; Fernald & Weisleder, 2011; Stobbart & Alant, 2008). Within the context of the sociocultural theory, early experiences help a child develop an understanding of the

relationship between literacy as a printed form of language (Mol & Bus, 2011). Most importantly, the social value of literacy is established in the home (Stobart & Alant, 2008). Outcomes for children in literacy are a reflection of and can be predicted by the quality of those early experiences (Roberts, Jurgens, & Burchinal, 2005). Vygotsky's theory provides framework with which to consider language and literacy learning given the strong research support for early language outcomes as a predictor of future literacy success (Aram et al., 2006).

Three specific aspects of Vygotsky's theory of learning that directly apply to children's development of language and literacy: (a) knowledge acquisition as social experience, (b), mediated learning through a *more knowledgeable other*, and (c) zone of proximal development (ZPD). Vygotsky's (1978) first concept, that knowledge acquisition is a social experience, posits that meaning is developed through the interactions with others, not as just a result of cognitive development (Aram & Levin, 2010; Plessow-Wolfson & Epstein, 2005). Furthermore, all acquisition of knowledge is first shaped by others (interpersonal process) and then internalized by the child (intrapersonal process; Presseisen & Kozulin, 1992, p. 9). Presseisen and Kozulin (1992) provided an example of this process. When a female infant child attempts to grab her milk bottle beyond her reach, her fingers make a grasping motion. The motion itself has no meaning at this point, but rather it is an unsuccessful attempt to grasp something. However, when the child's mother comes to her aid, the child observes a reaction, not from the bottle, but from her mother. As such, the meaning of the motion is now established. The grasping movement then changes to the act of pointing, and its meaning and function were developed by the people who surround the child. The authors state,

“The meaning of one’s own activity is thus formed by mediation through another individual” (p. 10).

Vygotsky (1978) termed a primary element of his sociocultural theory the “more knowledgeable other” to identify the person who provides information that aids in the child’s development (p. 86). The more knowledgeable other (MKO) does not have to be a parent; he or she can be an older sibling or family friend. The MKO mediates learning by providing information just beyond the child’s present level of knowledge. Mediated learning through a more knowledgeable other relies on collective knowledge and cultural norms (Presseisen & Kozulin, 1992). For example, a child points to an orange and asks what it is. A nonmediated response would be to provide a label. A mediated response would be to refer to the category (*it’s a fruit*) or the senses (*it tastes sweet*) or its function (*you can eat it and it’s good for you*; Presseisen & Kozulin, 1992).

Finally, for the MKO to mediate learning effectively and help the child develop knowledge, the MKO has to be able to discern the current range of knowledge as well as how far beyond the child’s present level of knowledge to provide information. Vygotsky called this range the Zone of Proximal Development (ZPD), which is the distance between the actual developmental level (performed independently) and the level of potential development under adult guidance (performed dependently). An effective MKO will mediate learning within the ZPD and not beyond because the child cannot acquire knowledge outside his or her ZPD no matter how intensely the adult guides the child; thus, the potential of development is not limitless. The adult practice of mediating learning within the child’s ZPD is called *scaffolding* (Musselman & Kircaali-Iftar, 1996;

Tudge & Winterhoff, 1993). Scaffolding is the process of helping a child move from dependent performance to independent performance within their ZPD.

**Parental scaffolding and language/literacy development.** Parents who can scaffold effectively, meaning that they can appropriately converse within their child's ZPD, can improve language outcomes for their child with a language delay or those at risk for a language delay (Dieterich et al., 2006; Janjua et al., 2002; Morelock, Brown, & Morrissey, 2003; Quittner et al., 2013). When studying parent-child language interactions, researchers consider several measures including (a) adult word count (i.e. mean length utterance) to examine adult language input (Barnes, Gutfreund, Satterly, & Wells, 1983; Christakis, D.A. et al., 2009; Zimmerman et al., 2009), (b) adult-child conversational turns to measure the quality of the social interaction (Niparko et al., 2010; Zimmerman et al., 2009), and (c) parental verbal scaffolding (also known as *maternal scaffolding* (Morelock et al., 2003), *interaction style* (Janjua et al., 2002), and *parental sensitivity* (Quittner et al., 2013)) to measure effective mediation.

Consistent with Vygotsky's theory, research demonstrates three levels of skill related to parent-child interactions that facilitate language development in children. First, adult language input is important (Hart & Risley, 1995), and hearing and DHH children who hear more words perform better on language outcome measures (Montgomery, Gilkerson, Richards, & Xu, 2009; Quittner et al., 2013; Zimmerman, 2009). Second, when parents not only talk to their children but also interact and have conversations, children perform even better on language outcome measures than just with higher language input alone (Neuman, 2011). For example, a study with 275 families with hearing children ages two months to 48 months showed positive effects from increased

adult word counts for language development, but more importantly, effects for adult-child conversations were maintained even when adult word count and televisions exposure were included (Zimmerman et al., 2009, p. 342). A large, longitudinal study of children who used cochlear implants (N=188) found that “maternal engagement in early communication reflected in greater scores of parent-child interactions was associated with increased development of spoken language skills” (Niparko et al., 2010, p. 1505). In another study with hearing and DHH children (N = 30), researchers found that conversational turns between parents and DHH children correlated with children’s receptive language abilities but adult word count did not (VanDam, Ambrose, & Moeller, 2012).

Vygotsky’s third level, even beyond parent-child interactions, is when parents appropriately scaffold language within their child’s ZPD. Janjua et al. (2002) examined scaffolding through interactions between 13 parents and their DHH children. The authors coded “contingent and child centered interactions” as interactions where parents expanded their child’s language “as a topic for further conversation” (p. 193) and concluded that the children with better language development had “more contingent and child-centered interaction[s]” with their parents” (p. 201).

**Challenges with scaffolding for parents of DHH children.** Within emergent literacy practices in the home, such as writing, “mediation refers to different levels of guidance that caregivers provide to children in writing words, thereby teaching them about the written system” (Aram & Levin, 2011, p. 190). Mediating learning effectively is especially relevant to DHH children because of a language mismatch between hearing parents and DHH children (Stobbart & Alant, 2008) or potential language delays

(Hartman, 1996; Janjua et al., 2002). If parents mediate their child's learning by scaffolding, they actually enhanced language and literacy development (DesJardin et al., 2008; Plessow-Wolfson & Epstein, 2005).

Stobbert and Alant (2008) make a strong case that hearing parents of DHH children should be more deliberate in gaining the knowledge to create social interactions where they can mediate their child's learning in order to see progress in language development and prevent language delays. One example where parent/child mediation can occur is *Shared Reading*. Shared reading is typically defined as an interaction between parent and child around a book, such as reading a book, pointing to pictures, or asking questions (Reese et al., 2010). The *What Works Clearinghouse* defines shared reading as "a general practice aimed at enhancing young children's language and literacy skills and their appreciation of books" (*Shared Book Reading*, 2006, p. 1). Delk and Weidekamp (2001) described a *Shared Reading Project*, originally developed by Schleper (1995), which attempted to enhance the shared reading experience between hearing parents and DHH children by creating opportunities for interactions and knowledge around Deaf culture and language development through books. Researchers examined literacy practices of language-matched families (Deaf parents reading to their Deaf children) and provided mentors to hearing parents to teach them the practices utilized by Deaf parents. Researchers identified practices such as (a) providing a positive environment, (b) having high expectations, and (c) following certain Deaf conventions for maintaining visual attention to help parents mediate their child's learning. The project increased participation, defined as reading books with their child, from 42% to 74% on a weekly basis (Delk & Weidekamp, 2001; *Shared Reading Project*, 2010).

Other studies have demonstrated differences between language-matched parent-child dyads and hearing parents of DHH children (Berke, 2013; Lederberg, Prezbindowski, & Spencer, 2000; Schleper, 1995; Spencer & Harris, 2006). In a study on maternal scaffolding and play with DHH children and typically developing children, out of nine mother-child dyads, the frequency with which mothers provided additional verbal and nonverbal information (scaffolding) did not increase from the hearing mothers of three DHH children, but it did occur in six of the hearing mothers of hearing children used scaffolding (Morelock et al., 2003).

**Successful scaffolding with DHH children.** While language mismatches and delays can present a challenge for some parents of DHH children, evidence suggests that mothers who successfully scaffolded their language during emergent literacy activities, by appropriately matching linguistic inquiries just beyond their child's language levels, were more effective in improving their child's language and literacy skills (Aram et al., 2006; DesJardin et al., 2008). In one study examining the interactions of mothers and their DHH children ( $N = 30$ ) during shared reading and writing, the authors concluded that successful mediation by the mother during storybook reading and writing activities predicted early literacy skills (Aram et al., 2006, p. 219).

In a longitudinal study of language skills of 16 mother-child dyads, the researchers videotaped two shared reading sessions to examine interactions that measured literacy skills through standardized tests three years later (DesJardin et al., 2008). All of the mothers were hearing and the children used cochlear implants. Of note, some mothers in the study used language facilitation techniques that were most appropriate for children with lower language than any of the children in this study. Authors identified high level

techniques as open-ended questions and recasting (i.e. repeating and expanding the child's utterance) as most appropriate for children with two to three utterances and beyond, and low level techniques like linguistic mapping (i.e. estimating the child's unintelligible word or phrase) as most appropriate for children at the one-word stage of development. Children of those mothers who used language facilitative techniques that were more appropriately matched to and expanded on their child's language scored higher on language and literacy measures of expressive language, letter- word identification and passage comprehension. The authors concluded that,

For children who demonstrate higher spoken language skills (e.g., three or more word phrases), these [low level] techniques may reduce children's opportunities to learn a variety of words and thus limit their vocabulary development . . . mothers' use of open-ended questions during joint storybook reading emerged as predictor variables for children's later basic reading skills. (p. 37)

Vygotsky's theory of learning helps provide the context for which to examine the home literacy environment's emergent literacy activities, and parents' subsequent influence on development of language and literacy. Three aspects of Vygotsky's theory, learning as a social experience, mediated learning through an MKO, and scaffolding within the child's ZPD, are important for fostering ideal literacy learning for children (Janjua et al., 2002; Morelock et al., 2003). Evidence supports that, for DHH children, skill with scaffolding within the ZPD positively contributes to language and literacy development (Wertsch, 1979, 1980).

### **Mediating Literacy through Shared Reading**

Emergent literacy activities in the HLE span various language and literacy activities in the research (National Early Literacy Panel, 2008). One of the most popular ways to examine aspects of effective emergent literacy practice is through shared reading

(Bus, van Ijzendoorn, Pellegrini, 1995; Doyle & Bramwell, 2006; Williams, 2012).

Within the context of the sociocultural theory, shared reading helps children acquire knowledge (e.g. vocabulary, general knowledge, and reading skills) through the interaction between children and their parents, and this knowledge would not occur from the child acting alone, such as through exploring books (Robertson et al., 2006). For hearing children, shared reading has been extensively studied and meta-analyses of the evidence revealed that shared storybook reading has positive effects on language development (Mol et al., 2009; Reese et al., 2010). As a predictor for reading achievement, shared storybook reading explained 8% of the variance in children's expressive vocabulary (Mol, Bus, deJong, & Smeets, 2008). Consistent with Vygotsky's theory, interactive shared reading, defined as encouraging a conversation around the book by asking questions, expanding answers, and praise (Lonigan, Anthony, Bloomfield, Dyer, & Samwel, 1999), is more effective than traditional shared reading, which is defined as the parent simply reading the text (Hargrave & Sénéchal, 2000; Mol et al., 2009). For DHH children, two intervention studies using shared reading with DHH children will be described in detail as well as a few descriptive studies that carefully identify the challenges with using the practice when there is a language mismatch between parent and child or the presence of a language delay.

Shared reading has strong social validity and Reese et al. (2010) note that parents receive the message at the "pediatrician's office, the grocery store, and on television and radio" that shared reading will benefit their child's early learning (p. 103). Indeed, shared reading shows beneficial outcomes for building expressive and receptive language (Ezell, Justice, & Parsons, 2000; Jordan, Snow, & Porche, 2000; Whitehurst & Lonigan, 1998;

Peterson et al., 1999; Sénéchal, Pagan, Lever, & Ouelette, 2008) as well as being flexible enough to target additional early literacy skills, such as print knowledge and phonological awareness, within the same context (Aram & Aviram, 2009; Chow, McBride-Chang, Cheung, & Chow, 2008; Jordan et al., 2000; Justice & Ezell, 2000; Wasik & Bond, 2001). Several meta-analyses demonstrate the effectiveness of shared reading for language development (Mol et al., 2009; Mol et al., 2008; Swanson et al., 2011). The most recent examined a total of 29 intervention studies for children at risk for reading difficulties and found that “children who received read-aloud interventions significantly outperformed children in the comparison group on measures of language” (Swanson et al., 2011, p. 267). A slightly larger meta-analysis included 31 studies on shared reading and found that “the oral language of children exposed to an interactive reading program gained 28% more than their peers in a control group . . .” (Mol et al., 2009, p. 998). The same meta-analysis also examined the effects of shared reading on print concepts and found that 7% of the variance in kindergarten alphabetic knowledge could be explained by shared reading (Mol et al., 2009). Additionally, authors found positive effects for print concepts and phonological awareness for children who are at risk for reading difficulties (Swanson et al., 2011).

More importantly, however, the results of these meta-analyses indicated that shared reading that is interactive in nature can significantly increase the language outcomes for children (Mol et al., 2009; Swanson et al., 2011). Interactive reading requires parents to read *with* their children, not just *to* their children, and have a conversation around the book (Lonigan et al., 1999). Mol et al. (2009) found that techniques such as eliciting and reinforcing verbal responses by the child were more

effective in building language than just reading the text (i.e. traditional shared reading). Certain reading techniques that delegate the adult to the role of the active listener by encouraging the child to talk about the story through prompts, questions, and expansion of the child's language are particularly effective (Lonigan et al., 1999; Whitehurst et al., 1988). In a comparison of the two shared storybook reading interventions described earlier, the authors found that the use of interactive shared reading was more effective in increasing expressive language than the use of traditional reading alone (Lonigan et al., 1999). The *What Works Clearinghouse* reviewed multiple studies using shared reading with young children (preschool and Kindergarten children) and determined that implementation of interactive reading techniques had positive effects on language development, print knowledge, and early reading/writing (*Interactive Shared Book Reading*, What Works Clearinghouse, 2007b), as well as spelling (*Project Star*, What Works Clearinghouse, 2007d) and general reading achievement (*Little Books*, What Works Clearinghouse, 2007c).

**Shared reading with DHH children.** Similar to studies on hearing children, several descriptive studies found links between the quality of shared reading interactions to language and literacy outcomes in DHH children, yet research is limited (Aram et al, 2006; DesJardin et al., 2008; Fung et al., 2005). In a study of 30 Israeli kindergarten DHH children, Aram et al. (2006) found that interactive behaviors during shared reading predicted phonological awareness skills, general knowledge, and receptive vocabulary with higher levels of interactivity and scaffolding between mother and child dyads leading to higher outcomes in linguistic and alphabetic knowledge skills. The researchers measured mediation of language through a four-step cycle where “(1) Adult prompts the

child with a question, (2) child answers, (3) adult praises the child's efforts, and (4) adult expands on the child's verbalizations" (p. 213). After controlling for age and degree of hearing loss, mediation during shared reading explained a significant amount of variance for linguistic skills including phonological awareness (22%), general knowledge (23%), and receptive vocabulary (18%). DesJardin et al. (2008) found similar results in a longitudinal study of 16 young children with cochlear implants in which mothers' use of interactive, higher level questioning during storybook reading was related to positive outcomes in literacy skills three years later. These two studies found a correlation between interactive shared reading and literacy outcomes in DHH children. However, more research is needed to draw conclusions about using the practice with DHH children.

**Available intervention studies.** Two intervention studies examining interactive shared reading with DHH children revealed mixed results for vocabulary development. The first study implemented interactive shared reading program with four preschool DHH children and their parents using electronic books (ebooks) that included videos of interactive questioning as well as parent training modules (Mueller & Hurtig, 2010). The parents in this study were hearing and three of the four were not proficient in the language used by their child (ASL). To address the mismatch of language, the authors embedded a signing narrator to provide appropriate levels of questioning and interaction. A single-case design showed very few differences between the treatment condition with a signing narrator and the non-treatment condition without a signing narrator on measures of (a) time spent with the ebook, (b) time spent on parent training, or (c) vocabulary acquisition. All of the children and the parents increased their vocabulary acquisition

during the study but the research design did not demonstrate that the growth in vocabulary was a result of the intervention.

The second study showed positive effects for vocabulary growth in 28 Chinese children with hearing loss. Fung et al. (2005) implemented an interactive shared reading intervention with kindergarten through second grade DHH children, comparing them to a control group as well as a traditional storybook reading group. In the traditional storybook reading group, researchers gave parents books and told them to read as they normally would to their child at least two times out of the week. For the interactive shared reading group, the authors taught the parents interactive strategies that included language expansion, question prompts, and praise. Supplemental materials for the intervention group including vocabulary cards and pre-written question prompts, in addition to the books read at least two days out of the week were used. The researchers measured receptive vocabulary on a translated version of a standardized assessment before and after the study. After eight weeks of intervention, outcomes on vocabulary between the intervention group and the other two groups differed significantly. They concluded that the dialogic [interactive] reading group made greater gains in receptive vocabulary skills as compared to the other two groups. Also important, the authors noted that the typical reading did not show significant gains as compared to the control group suggesting that reading alone is not enough.

**Challenges to interactive shared reading with DHH children.** Out of two intervention studies, only one showed outcomes for interactive shared reading similar those observed in hearing children. Of note, interactive shared reading interventions are typically design for and implemented with younger children than the children who

participated in the DHH intervention discussed (Mol et al., 2009; Fung et al., 2005). In Mueller and Hurtig's (2010) study, the authors faced challenges with noncompliance with one of their parents who reportedly "did not accept his [her son's] hearing loss and . . . she may have viewed using of the parent training ebooks as a waste of time" (p. 95). Some of the challenges around emergent literacy practices with DHH children are noted earlier in this review. More focused attention to these challenges in the context of implementing interactive shared reading will be discussed here. These challenges may include (a) a language mismatch between the parent and child (Stobbart & Alant, 2008), (b) a focus on the text in a directive style or utilization of low level language techniques rather than the conversation around the story (DesJardin et al., 2008; Swanwick & Watson, 2005), and (c) feelings of inadequacy around shared reading (Gioia, 2001; Swanwick & Watson, 2005).

First, Mueller and Hurtig (2010) illustrated the challenge of a language mismatch between parent and child. The authors created a signing ebook to simultaneously teach the parent sign language alongside the child. While the authors did include interactive questions as part of the intervention, this style of interaction (driven by the technology not the parent) does not fit within Vygotsky's model of learning because the parent could not act as the MKO for language development. This is not to suggest that the DHH children in the study did or could not learn language using this format, but, consistent with the results of the study, the DHH children in the study did not have the opportunity to learn language from their parent. Similarly, in Gioia's (2001) descriptive study, the author described the children becoming empowered with shared reading techniques at school and "taking home what they had come to value, teaching their parents how to

share a book with a deaf child” (p. 424). Children demonstrated control of the shared reading interaction at home, including correcting the placement of a caregiver’s signs, asking questions of their parents, and predicting aspects of the story. Again, the behavior of the children revealed an inability of the parent to mediate learning within the interaction (Gioia, 2001).

Even with DHH children who share the same spoken language as their parent, children may demonstrate delays in language that parents find difficult to scaffold effectively. Swanwick and Watson (2005) described their observations with shared reading for DHH children using spoken language. The authors stated that parents of DHH children using spoken language were overly focused on reading the text and interrupted the child’s reading ”to teach the meaning of individual words, to check comprehension, and to correct pronunciation so frequently that the result was that the children were not reading quickly enough to gain meaning from the text” (p. 69). The behavior of the caregiver in this scenario reveals a need to address inefficient language or speech skills. A directive parental style during shared reading using low level language techniques may be more suited for children at a one-word language level (DesJardin et al, 2008) In both of these studies, conversations and interactions around the story, the critical elements of interactive shared reading, were missing skills for some parents of DHH children. The experience for the caregiver and the child can overall be a negative one when it becomes too therapeutic and less of a social experience (Swanwick & Watson, 2005).

Although the instructive type of interaction may appear to fit more closely with Vygotsky’s theory, what is described here is not learning mediated within the child’s ZPD. In other words, the caregiver is not effectively scaffolding instruction just beyond

the child's current level of knowledge but rather bombarding the child with information consistently beyond the current ZPD (Swanwick & Watson, 2005) or providing the child with too little information below their current ZPD (DesJardin et al., 2008). Mueller and Hurtig (2010) suggest that parents need additional training to learn to interact effectively with their DHH children during shared reading. Without open-ended questions, language expansions, and increased conversational turns, it is likely that these DHH children will not make as much progress with language and literacy development as their DHH peers whose parents effectively make use of these scaffolding techniques, as suggested by research (DesJardin et al., 2008).

### **Effective Parent Training**

Parents need more training to learn to be more effective mediators of knowledge for their DHH children (Mueller & Hurtig, 2010). Several studies demonstrated desired outcomes for changes in parent behavior such as, (a) increases in positive parent-child interactions (Kaminski, Valle, Filene, & Boyle, 2008), (b) increases in mother's affective and cognitive-linguistic supports during shared reading (Landry et al., 2012), and (c) increases in interactive shared reading behaviors in mothers with various child populations (Huebner & Meltzoff, 2005; Rosa-Lugo & Kent-Walsh, 2008). Mueller and Hurtig (2010), who used an ebook training for hearing parents of DHH children, did not demonstrate changes in parent behavior as a result of their intervention. I discuss conclusions from these studies on effective parent training elements, especially those related to interactive shared reading, in the section below.

In a meta-analysis of components associated with parent training program effectiveness researchers examined 77 evaluations of parent training programs and

investigated program content and delivery method in an effort to predict effect sizes (Kaminski et al., 2008). Predictor variables for more effective parent training included program components for creating positive interactions [following the child's lead enthusiastically] between parent and child as well as trainings that required parents to practice new skills with their own child during training sessions. A combination of these components and delivery method showed larger effects on desired changes in the parents' and children's behavior, regardless of what else was included in the training (Kaminski et al., 2008, p. 581).

Correspondingly another study examined the carryover from a program that teaches general parenting skills to interactions during shared reading. The program targeted responsive parenting and positive interaction between mother and child (Landry et al., 2012). The participating mothers, who were mostly low-income, had children who were born full term ( $N = 80$ ) or very low birth weight ( $N = 86$ ). The researchers randomized the mother-child dyads into two interventions that began at birth through infancy and a second intervention that continued through the toddler/preschool years or an alternative control program. Facilitators of the intervention conducted training in the home for eleven sessions and provided materials to the families. Mothers were not specifically taught a shared reading program, but the materials provided included books. Trainers sometimes used shared reading as a context for implementing a certain strategy, such as targeting vocabulary. Results provide evidence that the combination of training programs (i.e. infant and preschool programs) effectively helped the mothers generalize language facilitation skills such as open-ended prompts, increased language expansions, increased positive interactions during reading, and increased prompts that promote

problem solving skills regardless of their child's birth status (Landry et al., 2012). While the researchers noted specific differences between those parents who participated in the infant program and not the toddler/preschool program, participation in both was necessary to see carryover effects for all of the variables mentioned.

Next, when investigating parent training specifically for shared reading, researchers began with *dialogic reading*, which is an already established interactive shared reading program that has shown positive effects for child outcomes in language (What Works Clearinghouse, 2007a; Whitehurst, 1992). In one large study, authors compared delivery methods for mixed-incomes families with two and three year old children and included (a) in-person training with video instruction in small groups, (b) self-instruction through a video with a telephone follow-up call, and (c) self-instruction through video alone. Baseline data demonstrated that parents used relatively few interactive techniques during shared reading without explicit instruction. Parents in the comparison group may have increased the amount of time they read to their child, but the quality of the readings did not change (Huebner & Meltzoff, 2005). Results indicated no significant difference between groups by delivery method, even for the self-instruction group with only the video. However, when considering parents' education level by delivery method, "there was a significant difference favoring in-person instruction as the more efficacious method of instruction, especially for parents with high school education" (Huebner & Meltzoff, 2005, p. 296). Huebner and Meltzoff (2005) note that an earlier study suggests that video-alone training produced significant gains in child language skills (Arnold, Lonigan, Whitehurst, & Epstein, 1994); however, the 64 study

participants were upper-income parents who were already reading to their children (Huebner & Meltzoff, 2005).

Two other studies provide additional information to consider when developing effective parent training programs. The first included five first-grade readers and their parents and measured parent training and parent tutoring, from which researchers found positive results on increases in words read correct per minute for four of the five students (Resetar, Noell, & Pellegrin, 2006). A critical component of implementation was progress monitoring at home and school as well as individual training rather than training in a group setting. Secondly, in the only interactive shared reading intervention study with DHH children, Fung et al. (2005) specified that trainers individually instructed parents prior to the intervention for 20-minute sessions. Researchers also gave parents materials including a guidebook describing the purpose of shared reading, a calendar checklist, books, pre-written question prompts, and picture cards to help children create responses. Researchers followed up with phone calls once a week for the first two weeks to remind parents to read to their children. Even though these researchers used the same program as Huebner and Meltzoff's (2005) study (*dialogic reading*) examining delivery method, the families with DHH children received quite a bit more support (Fung et al., 2005).

Based on the conclusions of various above-mentioned studies, an effective interactive shared reading parent training program for families with DHH children would address the language mismatch between hearing parents and DHH children who use sign language or have insufficient auditory access to spoken language (Lederberg et al., 2013). An intervention program may also have several components to relay information and

explicitly teach strategies, but can weigh individual versus group training based on feasibility and parent characteristics (Kaminski et al., 2008).

First, for DHH children who have a mismatch in language with their caregivers (e.g. ASL and spoken language) or lack of auditory access to spoken language, parent training should include information on the importance of remedying the language mismatch through improved proficiency in sign language by the parents or improved audiological management and auditory training for the child (see Colorado's *Early Literacy Development Initiative* for more information; Delk & Weidekamp, 2001; Yoshinaga-Itano, 2003). Without considerable effort around resolving the mismatch, there is significant evidence to suggest that DHH children will not fulfill their potential for language development (Lederberg et al., 2013; Spencer & Marschark, 2010) and preliminary evidence to suggest that other interventions such as interactive shared reading for building language will not alleviate or mediate this obstacle for DHH children (Mueller & Hurtig, 2010).

Next, the research literature provides strong evidence regarding the need to build a positive and interactive home literacy environment (Aram & Aviram, 2009; Quittner et al., 2013; Snow et al., 1998), especially considering the uncertainty that may exist around shared reading between hearing parents of DHH children (Delk & Weidekamp, 2001; Gioia, 2001; Swanwick & Watson, 2005). Information designed to build a global perspective of shared reading as a positive experience and boosting positive interactions in the HLE could help parents improve their literacy environment and their ability to facilitate language development for their DHH child (Kaminski et al., 2008). Also, targeting information on the importance of child-directed, positive interactivity can be

taught directly through parent training on shared reading or indirectly through interventions on general parenting skills (Huebner & Meltzoff, 2005; Landry et al., 2012).

If an existing parenting intervention is not already in place, there is also a clear need to teach interactive strategies for shared reading explicitly including increasing open-ended question prompts, encouraging conversations, and scaffolding (DesJardin & Ambrose, 2010; DesJardin et al., 2008). Parents do not typically use interactive strategies during shared reading and providing books alone may not increase interactive behavior (Huebner & Meltzoff, 2005). Including strategies to increase conversations and interactivity are important because DHH children's language development is contingent on the levels of interactivity with the parent or caregiver (Quittner et al., 2013). Especially for those children with language delays, specificity on strategies that will lead to effective scaffolding, through appropriate mediation of learning, appear to be a crucial component for the parents and DHH children (DesJardin et al., 2008). Providing parents with information on how to assess their child's current language levels informally and to provide information systematically just beyond their child's current level could ensure that they are not outside the range of the ZPD (DesJardin et al., 2008).

Finally, while several parent training interventions are dependent on and contribute their successes to home visits or individual training, this may not be cost-effective or feasible for every program (Huebner & Meltzoff, 2005). As such, community or group training may be a viable alternative, and these community programs also show evidence of success for increasing desired parent behaviors (Huebner & Meltzoff, 2005). Giving parents opportunities to practice with their own child can be incorporated into a

group model to increase chances of success (Kaminski et al., 2008). What seems to be central, however, is the need to consider the population of parents involved including education level (Huebner & Meltzoff, 2005) and the presence of disabilities in the children (Fung et al., 2005; Landry et al., 2012). Parents from low-income families or with a high school education (Huebner & Meltzoff, 2005) demonstrated higher outcomes for interactive shared reading when training was done in person. Certainly, the amount of support that researchers gave to parents in the *dialogic reading* study should be considered, such as inclusion of materials that provide information, question prompts, pictures, books, and a checklist to track shared reading sessions (Fung et al., 2005).

Survey of the research literature provides indications of the components and delivery model of a successful parent intervention model for interactive shared reading with families of DHH children. Cost effectiveness and feasibility may determine group versus individual training, but parents practicing with their own child has strong support for better outcomes (Kaminiski et al., 2008). Finally, explicit instruction on strategies to increase interactivity and conversations around the book are important in creating a positive HLE (DesJardin et al., 2008; Snow et al., 1998).

### **Conclusion**

DHH children are at risk for language delays, and there is strong support that language influences outcomes in reading (Lederberg et al., 2013). The home literacy environment builds the foundation for early language and emergent literacy (Reese et al., 2010; Snow et al., 1998), and, given the opportunity through early identification and intervention, DHH children can access their HLE to share the benefits of better language and literacy outcomes as a result of the emergent literacy activities that many hearing

children experience (Mol & Bus, 2011). Vygotsky's (1978) sociocultural perspective is an appropriate theoretical foundation upon which to frame emergent literacy activities in the home before children attend school because it explains how social interactions between the caregiver and the child facilitate development of language and literacy. Shared reading is a common emergent literacy practice in homes of families with hearing children. Shared reading builds and facilitates language more effectively when it is interactive, that is, when the parent and child are having a conversation around the book (Mol et al., 2009). However, parents report feelings of inadequacy or inability to interact effectively with their children (Gioia, 2001), and researchers observe ineffective behaviors such as attempting to scaffold too low for the child's language level (DesJardin et al., 2008).

Interactive shared reading provides a strong link between language and literacy outcomes in DHH children (Aram et al., 2006; DesJardin et al., 2008) and can be effective in improving vocabulary in DHH children (Fung et al., 2005). However, there is insufficient empirical evidence to conclude that interactive shared reading is a best practice for DHH children or to extrapolate the best ways to train parents to use the strategy. An examination of the existing research on parent training supports the development of effective interactive shared reading intervention for families with DHH children. We need appropriate delivery methods such as in-person individual or group trainings ensuring time for parents to practice with their own child (Huebner & Meltzoff, 2005; Kaminski et al., 2008). Next, strategies for building positive HLE and improving interactions between parent and child may yield better early literacy outcomes (Kaminski et al., 2008). Finally, components of the intervention may include explicit instruction on

strategies that build language expansion, open-ended questions, and scaffolding. An interactive shared reading intervention using effective delivery models with effective strategies may help parents and professionals bridge the parent- child language mismatch and build language capacity.

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## CHAPTER 2

EFFECTIVENESS OF PARENT TRAINING ON SHARED READING PRACTICES  
IN FAMILIES WITH CHILDREN WHO ARE DEAF AND HARD OF HEARING

Children who are deaf and hard of hearing (DHH children) are being identified, on average, up to two and a half years younger than they were 10 years ago (Houston, Bradham, Munoz, & Guignard, 2011; Yoshinaga-Itano, 2003). Of these DHH children who are identified early, about half are in intervention by the target age of 6 months and most have the potential to develop language at a typical rate (Lederberg, Schick, and Spencer, 2013). However, research on effective interventions for DHH children has not caught up to a rapidly changing—and significantly younger—population, most notably, in the area of parent-implemented interventions. Additionally, there are several risk factors for language delays in DHH children, including delayed identification and intervention (Marschark, Rhoten, & Fabich, 2007), lack of access to language in the home, and lack of knowledge regarding optimal language-learning approaches (Lederberg et al., 2013). A younger DHH population coupled with a risk for language delays demonstrates a clear need to target parent-implemented, language facilitation interventions to facilitate or remediate language delays.

Previous research on facilitation of language in the home environment during the birth-to-five period for DHH children is limited (Williams, 2012). One strategy that is widely used to facilitate language in hearing children is interactive shared reading, which is the practice of a caregiver reading and encouraging engagement and conversation around a book (What Works Clearinghouse, 2007). Currently, only two studies have examined interactive shared reading with DHH children, with mixed results (Fung, Chow, & McBride-Chang, 2005; Mueller & Hurtig, 2010). The two studies both showed

promise for the DHH population, including acquisition of vocabulary, but simultaneously demonstrated a need for more research to provide clarity on which aspects of the practice might need to be modified for DHH children to account for the unique needs of various DHH children and their families (Andrews, 2012; Williams, 2012). In fact, researchers have identified a few strategies that build language during shared reading for DHH children, such as open-ended questioning, language expansions, and scaffolding (DesJardin, 2006; DesJardin, Ambrose, & Eisenberg, 2008), but there is no research examining effective parent training for these strategies. This study used a single-case research design because this design allows researchers to demonstrate a functional relationship between an intervention and an outcome (Kazdin, 1982; Kennedy, 2005). The current study is an attempt to identify effective parent training that encourages the use of three effective shared reading strategies for language development.

## **Literature Review**

### **Language Acquisition for DHH children**

All children acquire their first language in the home through interactions with people in their environment (Bodrova & Leong, 2006). Birth to five years of age is considered the window of opportunity for language development, with typical language development beginning at birth (Yoshinaga-Itano, 2003). Historically, children who are deaf and hard of hearing (DHH) faced challenges in acquiring language because they were not usually identified until between two and a half to five years of age (Houston et al., 2011; Lederberg et al., 2013). Thus, DHH children had missed anywhere from 3 to 5 years of language development (Spencer & Marscharck, 2010). Currently, though, due to Universal Newborn Hearing Screening, about 98% of children born in a hospital are

identified earlier (Houston et al., 2011), and about half of the eligible children receive intervention services by 6 months affording them the opportunity to learn language within a typical timeframe (Lederberg et al., 2013).

However, even with earlier identification and especially those who do not make it into intervention by 6 months, DHH children may still face challenges in acquiring language due to lack of access to language in their natural environment (Spencer & Lederberg, 1997). To achieve typically developing language, intense effort on the part of the family is required as well as focused attention on access to language in the home (Spencer & Marschark, 2010). Hearing parents, who represent 92% of the population of parents with DHH children (Mitchell & Karchmer, 2004) may not realize the factors that contribute to an optimal language-learning environment, such as an intentional effort to facilitate language in the home and considerable family involvement (Lederberg et al., 2013). Additionally, families must make a commitment to becoming fluent in sign language (e.g., American Sign Language; Spencer & Marschark, 2010) or aggressive audiological management through digital hearing aids or cochlear implants (Niparko et al., 2010) so that their DHH child has full access to rich language models in the home. Even still, several factors for successful outcomes are still yet untested and unknown (Marschark, 2001).

One factor that is known to produce successful outcomes in some DHH children is the type and intensity of adult language by the parent as well as the language interactions between the parents and the DHH child (Aram, Most, & Mayafit, 2006). The amount of family talk around and directed to the DHH child is key, but even more important is the quality of talk between the family members and their DHH child

(Quittner et al., 2013; Szagun & Stumper, 2012). Researchers examining interactions between mother-child dyads found that mothers who gauged their conversations too low based on their DHH child's current language levels actually hindered further language development (DesJardin et al., 2008). Caregivers can create opportunities to have conversations with their DHH child by increasing open-ended questions and expanding their language (DesJardin et al., 2008) as well as appropriately scaffolding their language to their child's language level (Janjua, Woll, & Kyle, 2002). One practice that incorporates these language facilitation techniques is interactive shared reading (Mol, Bus, & de Jong, 2009; Whitehurst, 1992).

### **Shared Reading**

Interactive shared reading, where an adult reads and encourages conversations around a book, is a successful intervention with hearing children to improve vocabulary, language, and some early reading skills (Mol & Bus, 2011; Mol et al., Bus, & de Jong, 2009; Mol, Bus, de Jong, & Smeets, 2008). But there are very few empirical studies that have demonstrated positive outcomes in vocabulary using interactive shared reading with DHH children (Fung et al., 2005). These authors examined vocabulary growth in 28 Chinese children with hearing loss and showed positive growth as a result of an interactive shared reading program. The authors separated their mother-child dyads into three groups, a control group, a traditional storybook reading group, and an interactive reading group using an intervention called "dialogic reading" (Fung et al., 2005). The authors gave the traditional storybook reading group the same books as those in the intervention group and told them to read as they usually would. For the dialogic reading group, researchers taught parents how to implement the intervention that included

strategies to increase open-ended questions as well as language expansions. Researchers also gave parents books for 8 weeks, as well as materials to aid their implementation including a calendar for tracking that they read at least two times a week, vocabulary cards to help children respond to questions, and pre-written question prompts. Authors noted that not only did the dialogic reading group children make significant gains in receptive vocabulary but that the traditional storybook reading group did not show greater improvement than the control group, indicating that just reading alone will not make improvements.

However, while the abovementioned study showed positive results for vocabulary acquisition, several researchers have identified challenges with using interactive shared reading with DHH children because it requires language competence on the part of the parent, accessible language by the DHH child and a shared language between parents and child (Gioia, 2001; Stobbart & Alant, 2008; Swanwick & Watson, 2005). Hearing parents of DHH children may have a language mismatch if their child uses sign language to communicate as was the case in one study examining interactive shared reading with DHH children and hearing parents (Mueller & Hurtig, 2010). This study used an interactive ebook to teach both the DHH children and their hearing parents sign language vocabulary. The ebook intervention did not show positive effects for vocabulary acquisition as a result of the intervention, and the authors noted that one of the mothers did not spend time on the sign language parent training section of the ebook (Mueller & Hurtig, 2010). Additionally, Stobbart and Alant (2008) noted through observation that the hearing parents were more likely to focus on the text instead of engaging in conversation around the story, and Gioia (2001) noted that hearing parents avoided shared reading

because of a lack of efficacy which may have been due to an inability to appropriately scaffold their language development if their DHH child has a language delay. Given the documented need for more research on interactive shared reading with DHH children (Williams, 2012) and the compelling evidence that interactive shared reading is effective for children who are hearing to facilitate language skills (Mol, Bus, & de Jong, 2009), future research could investigate what aspects of interactive shared reading are essential for language development in DHH children, including the modifications needed for this population, and if parents can be taught to acquire those skills.

### **Parent Training**

Skills such as increasing open-ended questions, language expansions, and effective scaffolding are all positively correlated to language outcomes in DHH children, and these skills integrate well into interactive shared reading (Desjardin et al., 2008). Given the difficulties with shared reading among hearing parents with DHH children, research examining effectiveness of parent training for each of these strategies seems warranted. Many of the interactive reading parent trainings that were effective in increasing vocabulary scores in children involved short, generic trainings, usually lasting no more than 20 minutes to an hour, and sometimes just on videotape, with no live trainer on site (Huebner & Meltzoff, 2005; Sénéchal & Young, 2008). However, a meta-analysis on parent training suggested that the delivery of parent training in person is important when there is diverse socio-economic parent population and the content of the training should include opportunities for the parent to practice the new strategy with their own child (Kaminski et al., 2008). Additionally, the dialogic reading intervention study

included supplemental materials to help parents implement the intervention (Fung et al., 2005).

### **What We Know**

Based on the conclusions of the various abovementioned studies, an effective interactive shared reading parent training program for families with DHH children would first and foremost address any language mismatch between hearing parents and DHH children who use sign language or have insufficient auditory access to spoken language (Lederberg et al., 2013). Next, the program could target three shared reading strategies that have support for facilitation of language in DHH children including open-ended questions, language expansions, and scaffolding. As DHH children's language development is contingent upon high levels of interactivity with the parent or caregiver (Quittner et al., 2013), and, especially for those children who might have a language delay, explicit strategy instruction that will lead to appropriate scaffolding appears to be a crucial component (DesJardin et al., 2008). Finally, while some parent training programs use short, generic trainings to teach shared reading, most likely in efforts to work within available resources, a feasible option could be a community-based training that provides some guided feedback for parents while practicing with their own child (Kaminiski et al., 2008). Additionally, materials on how to individualize implementation may improve successful outcomes (Fung et al., 2005).

### **Current Study**

The present study was part of a larger study examining the effectiveness of a preschool literacy curriculum called *Foundations for Literacy* (hereafter referred to as *Foundations*; Lederberg, Miller, Easterbrooks, & Connor, unpublished curriculum). The

present study was designed to examine a parent training component of the *Foundations* curriculum. All of the children in the present study were a part of the school portion of the *Foundations* curriculum but participation in the parent study was on a voluntary basis. The present study was a 12-week, single case design that examined the effects of a parent training program on specific behaviors during shared storybook reading that positively relate to language development in DHH children. The parent training targeted three strategies through explicit instruction: (a) open-ended questions, (b) language expansions, and (b) scaffolding. The study design was a multiple baseline across content design to determine what effects, if any, there were as a result of the parent trainings to increase outcomes on the parent behaviors listed above. The research questions were (a) Can parents with DHH children learn to use open-ended questions during shared reading? (b) Can they learn to use language expansions during shared reading? (c) Can they learn to scaffold? Additionally, (d) Does introduction of strategies change the rate per minute of yes/no questions?

## **Methodology**

### **Participants and Setting**

Children in this study were from a private, oral school in a large metropolitan area. Approval for the study was obtained through the university's Institutional Review Board (IRB) and the research officer at the school. Criteria for participant selection were (a) a hearing loss with an unaided pure tone average (PTA) of 50 dB or greater in the better ear, (b) no additional documented disabilities, (c) the ability to understand at least some spoken words presented, defined as a score of 3 (some word identification) or 4 (consistent word identification) on the *Early Speech Perception Test* (ESP Test; Moog &

Geers, 1990), and (d) chronological age between 3 years 8 months and 5 years 11 months of age as of September 1 of the school year. Classroom teachers sent home consent forms to the parents of nine children who met eligibility in two classrooms and who were participating in *Foundations*. The primary researcher informed the interested parents that they were would be responsible for recording a shared book reading experience at least four times a week for 12 weeks and attending three parent training workshops. Families were not required to participate in the parent trainings in order to participate in *Foundations*. Out of the nine eligible children, four parents expressed interest and four parent-child dyads were included in the study. Out of the five children who did not participate, four children's parents did not consent and one child's classroom placement changed near the beginning of the school year. The participant parents were female, and they identified spoken English as the language they used at home, communicating with their child through listening and spoken language (auditory/oral). Each of the student participants possessed a cochlear implant and had an Early Speech Perception Score of 4. Table 1 presents additional data about the four parent-child dyads based on parent questionnaires, children's audiograms, and standardized tests administered in the fall.

The school setting was a listening and spoken language program (i.e. auditory/oral) with approximately 60 families with DHH children who attended the school program from Parent-Infant intervention through second grade. The demographic information for the program is as follows: 49% White, 36% African American, 10% Hispanic/Latino, 2% Asian, and 3% more than one race. Over 90% of the families

Table 1

*Demographic Information on Participants*

Variable	Dyad 1	Dyad 2	Dyad 3	Dyad 4
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Parent				
Pseudonym	Renee	Patricia	Teresa	Kirsten
Hearing status	Hearing	Hearing	Hard-of-hearing	Hearing
Education Level	Some college	College	College	Post graduate
Student				
Pseudonym	Erika	William	Derek	Bryson
Age (years.months)	5.0	4.4	5.3	3.5
Gender	female	male	male	female
Self-contained classroom	Yes	Partially main-streamed	Yes	Partially main-streamed
SS PPVT-4	55	88	59	79
Age identified (month)	21	3	19	3
Age first implanted (month)	24	12	36	12
Age enrolled in intervention (month)	24	4	26	11

*Note.* LSL, Listening and Spoken Language (auditory/oral); CI, cochlear implant; SS, standard score; PPVT-4, Peabody Picture Vocabulary Test 4<sup>th</sup> Ed.

qualify for financial aid. Many of these families travel one or more hours to attend the program.

### **Data Collection and Instrumentation**

An audiorecording device called the Language ENvironment Analysis system (LENA) captured the data for this study (LENA Foundation, 2013). LENA is a language environment analysis system designed to provide parents, clinicians, and researchers with information about the language environment of children ages 2 months to 48 months. The LENA system contains a digital processor and high quality microphone that children wear in the pocket of clothing custom-made for the device. Researchers chose not to use the LENA system to analyze the data collected (analysis required several hours of data

collection); rather, they chose the LENA because of its crystal clear sound quality.

Audiorecordings from the device were exported and downloaded as audio computer files for coding the dependent variables.

Other measurement instruments included a demographic questionnaire and two social validity questionnaires. The Peabody Picture Vocabulary Test, Fourth Edition (PPVT-4) (Dunn & Dunn, 1997) is a receptive vocabulary test for children ages 2.6 years of age and up, and researchers assessed children in this study as part of the broader *Foundations* project. Here, the PPVT-4 provided demographic information regarding the children's current language development.

### **Dependent Variables**

A frequency count divided by number of minutes per session determined the rate of the three target behaviors during shared reading: (a) open-ended questions, (b) language expansions, and (c) scaffolding, and one additional behavior (d) yes/no questions. Researchers coded directly from the audiorecordings of the shared reading sessions. Operationalization of the behaviors matched the strategy instruction from the training. See Table 2 for the list of decision rules for operationalizing the behaviors and the resulting coding scheme. For all sessions during baseline and intervention, frequency of the four behaviors divided by the number of minutes per session determined the rate (Kennedy, 2005).

Table 2

*Dependent variables: Operationalized Behaviors and Coding Scheme*

Behavior	Operationalized examples	Non-examples
Open-ended questions	<ul style="list-style-type: none"> <li>Wh- questions: "Where</li> </ul>	<ul style="list-style-type: none"> <li>Affirming: "Is that</li> </ul>

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	<p>did he go?” “What is that?”</p> <ul style="list-style-type: none"> <li>• Fill in the blank: “He went to the ____.”</li> <li>• Code separately repeated questions that are different: “Where did he go?” “Where did Sam go?”</li> <li>• Either/or questions</li> </ul>	<p>right?”</p> <ul style="list-style-type: none"> <li>• Yes/No: “Did he go?”</li> <li>• Repeated questions that are the same: “Where did he go?” “Where did he go?”</li> <li>• Questions read from the text that are not directed to towards the child</li> <li>• Requests for repetition: “Can you say[ ]?”</li> </ul>
Language expansions	<p>Child utterance followed by an adult utterance that adds:</p> <ul style="list-style-type: none"> <li>• A grammatical structure “He <u>looks</u> into the pond.”</li> <li>• One or more words: “He looks into the <u>muddy</u> pond.”</li> </ul>	<ul style="list-style-type: none"> <li>• Repetition of the exact child utterance</li> </ul>
Scaffolding (safety nets)	<p>Coded one instance for an open-ended question AND coded as scaffolding if followed by any one of the following:</p> <ol style="list-style-type: none"> <li>1) Fill-in-the-blank prompt</li> <li>2) Either/or question</li> <li>3) A modeled answer</li> </ol>	<ul style="list-style-type: none"> <li>• Individual instances of fill-in-the-blank prompts, either/or questions, or a modeled answer. Code these appropriately.</li> </ul>
Yes/No questions	<p>Questions that require a yes/no response: “Did he go into the pond?”</p>	<p>Affirming: “Is that right?”</p>

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### **Independent variable**

The independent variable for the study was the parent training intervention, which instructed parents on interactive shared reading techniques. Intervention was led by the primary researcher, who is a former member of the *Foundations* team, through parent

trainings called a *Lunch Bunch* on three Fridays (which are typically half-days) during the fall semester. *Lunch Bunch* trainings occurred every four weeks, and the three strategies targeted were

1. Open-Ended Questions, which instructed parents on how to increase open-ended, fill-in-the-blank, or recall questions and reduce yes/no questions.
2. Language Expansion, which instructed parents on how to repeat back what their child said while adding one or two more words syntactically or semantically.
3. Scaffolding, which instructed parents on how to build “safety nets” when their child was unable to answer open-ended questions.

Efforts were made to reduce the jargon of these strategies and use common language. For example, the second strategy, Language Expansion, researchers chose to use “echo expansion” which is a more common way to describe the strategy. Additionally, for the third strategy, Scaffolding, this terminology is common among professionals when discussing this teaching strategy, but may not be as clear to those unfamiliar with the field of language development. This strategy was described as “building safety nets” and described three levels of “safety nets”, which were prompts that could be used if the child did not understand the open-ended question. These prompts were (a) fill-in-the-blank, (b) either/or (i.e. forced choice), and (c) model the correct response. Building safety nets was a strategic way to scaffold the child’s language and measure it for research purposes. See Table 3 for a description of the target practices and language used.

Additionally, several other broad topics were covered in the trainings that were necessary for the implementation of the intervention, including

- reviewing school library procedures and providing a school library book list
- displaying and discussing how to pick age-appropriate and language appropriate books by choosing books where their child knew “most but not all” of the vocabulary in the book
- encouraging parents to set up a designated place and time to read that was quiet and free of noise and distraction, including turning off the television and music
- encouraging parents to read the book again and again (*repeated readings*) (Schirmer, Therrien, Schaffer, & Schirmer, 2009; Kaderavek, & Pakulski, 2007)
- discussing the importance of allowing their child to learn the vocabulary and language of the story through repeated readings
- encouraging parents to choose a few vocabulary words or ideas (concepts) to work on and to ask questions about during the shared reading sessions
- discussing ways to carry over the words or ideas into everyday life activities such as cooking, crafts, or dinner conversations

Table 3

*Description of Target Reading Strategies*

Target practice	Common language used	Description of strategy and examples
Open-ended questions <sup>1</sup>	Open-ended Questions	Ask questions that have an open-ended response. Reduce Yes/No question. Question types include: <ul style="list-style-type: none"> <li>• Wh- questions (<i>who, what, when, where, why</i>). Ex. “<i>What’s he wearing?</i>” “<i>What’s happening on this page?</i>”</li> <li>• Recall questions. Ex. “<i>What’s going to happen next?</i>”</li> </ul>

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		<ul style="list-style-type: none"> <li>• Completion or fill-in-the-blank questions. Ex. “<i>He ate the _____ for lunch.</i>”</li> </ul>
Language expansion <sup>2</sup>	Echo-Expansion	<p>Repeat what your child says and expand on his/her response by adding one or two more words. You can add:</p> <ul style="list-style-type: none"> <li>• New vocabulary (ex. <b>Parent:</b> <i>He’s eating ice cream. How does it taste?</i> <b>Child says:</b> <i>Yummy</i> <b>Parent:</b> <i>That’s right, it tastes <u>delicious!</u> Delicious is really yummy!)</i></li> <li>• Grammatical structure (ex. <b>Parent:</b> <i>He’s running a race. How is he doing?</i> <b>Child says:</b> <i>He winning</i> <b>Parent:</b> <i>That’s right, he <u>is</u> winning the race)</i></li> </ul>
Scaffolding	Safety Nets	<p>Build a “safety net” for your conversations with these 3 steps:</p> <ol style="list-style-type: none"> <li>1. Ask open-ended questions</li> <li>2. If you get no response, rephrase it to a: <ul style="list-style-type: none"> <li>• fill-in-the-blank question</li> <li>• either/or question</li> <li>• provide the correct response</li> </ul> </li> <li>3. Ask the question again</li> </ol>

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*Note.*<sup>1</sup> Also known as **CROWD** question prompts (Whitehurst, 1992); <sup>2</sup> Also known as ‘recasting’ or ‘implicit corrective feedback’ and PEER (Whitehurst, 1992)

Age appropriate books at varying language levels were displayed and used during the trainings. These books were available for check-out after each training, and parents usually borrowed them and returned them in their child’s book bag. At the end of each training, a hand-out for the parents reviewed the target practice (Appendix A) and gave two examples of the practice for actual books at three language levels, described as *emerging* (below average language), *developing* (low average language) and *average or above average* (see Appendix A). The handouts had reminders for choosing a quiet reading area, repeated readings, choosing books, and picking vocabulary as well as ideas for extension activities. Additionally, a *Tier 2 Words* handout (Appendix B) was

distributed during the second training session to encourage use of higher level vocabulary (Beck & McKeown, 2007; Rollins Center for Language & Literacy, 2012).

### **Procedures**

This 12-week multiple baseline across content (shared reading strategies) included a baseline condition followed every four weeks by intervention in the following order: open-ended questions, language expansion, and scaffolding. *Lunch Bunch* flyers went out in book bags to invite all families in the school program, but primarily preschool parents attended. Between 6-8 parents, grandparents, nannies, and/or siblings attended the *Lunch Bunch* parent trainings, including the four families participating in the study. During parent trainings, teachers took children to the nap room for their typical full-day schedule while their parents ate the school lunch and participated in the parent trainings. Towards the end of the training, when the children began waking up, the teachers returned the children to their parents for the remainder of the session.

During the *Lunch Bunch* trainings, the primary researcher facilitated a one and ½ hour session that consisted of (a) a lunch where participants could ask questions, (b) a group activity where researchers asked participants to interact with each other and sometimes review a homework assignment, (c) some background information on the importance of language to literacy, (d) a description and instruction of one of three target strategies during shared book reading, (e) an opportunity for guided practice of the target strategy with a partner or group and a short homework assignment, and finally (f) an opportunity for parents to practice with their child with guided feedback.

The four parent/child dyads participating in the study were asked to record their shared reading sessions using a LENA audiorecording device. A brief training session

included information on how to turn the device on and off and how to record as well as a take-home sheet for a reference. Children wore the device in a pocket of a vest designed for the LENA device, and each parent was given a vest to take home and keep for the duration of the study. Parents had seven days to record at least four shared reading sessions using the same book title that the child had previously selected from the school or classroom library. Parents could read different titles during the week when they were not recording. At the end of the seven days, parents returned the audiorecorder and the selected book and received a new title and a blank device for the following week. In the event of an absence from the *Lunch Bunch* trainings (2 of 3 trainings for Dyad 2), or if a different parent than the reader attended the parent training (3 of the 3 trainings for Dyad 4), those parents were contacted for an in-person individual training. These makeup training sessions usually lasted about 15-20 minutes and covered the information from the training but did not have the practice time or guided feedback time.

### **Data Analysis**

In single-case design, each parent serves as his or her own control. Data were graphed and examined through visual analysis for changes in behavior between baseline and intervention, levels of outcomes, trends, and variability across phases (Kazdin, 1982; Kratochwill et al., 2010). Statistical analysis included (a) baseline mean, (b) intervention mean, (c) mean difference, and (d) immediacy of effect, as well as (e) effect size, which was determined using percent of non-overlapping data (PND). PND is the percentage of intervention data points falling above the highest baseline data point divided by the total number of intervention data points (Scruggs, Mastropieri, & Casto, 1987). Range for reporting PND: 1-100% and scale: < 50% reflects unreliable treatment, 50-70% reflects

questionable effectiveness, 70%-90% reflects fair effectiveness, and > 90% reflects high effectiveness (Wendt & Miller, 2012).

## Results

### Individual performance

Results are presented in figures displaying each parent's performance during baseline and intervention. The dotted line indicates between what sessions intervention (*Lunch Bunch* parent trainings) took place with baseline to left and intervention to the right. Sessions are consecutive across time. Each parent's performance is discussed with respect to stability of behaviors for baseline and intervention, level (calculated with the last three baseline points and the first three intervention points), trend, and variability of the intervention behavior (Kratochwill et al., 2010). Immediacy of effect is discussed when applicable (determined by the difference between baseline and intervention level) and effect size determined by percent of non-overlapping data. A summary of findings followed by detailed results for each strategy are included.

**Parent-Child Dyad 1.** Renee is a hearing woman who completed two years of college. Her daughter, Erika, is a 5-year-old girl with a PPVT score of 55. They exclusively use spoken language at home to communicate.

***Open-ended questions.*** Visual inspection of Figure 1 shows Renee's baseline is stable and all points are within 50% of the mean ( $M=0.2$ ). Her rate of open-ended questions dramatically increased after intervention, with a level change (immediacy of effect) from 0.2 to 2.6 signifying a level increase of 2.4 open-ended questions per minute of session from baseline to intervention. Renee showed a slightly descending trend line during intervention ( $M=1.5$ ), and significant variability ranging from 2.5 above the mean

to 1.45 below the mean (45% outside 50% of the mean). Her rate of open-ended questions never dropped below 0.5 questions per minute after intervention was introduced, which is still a rate of 0.3 questions per minute above her baseline mean. As such, Renee showed no overlapping data (100%) for this tier, indicating the intervention was highly effective for this tier.

*Language expansions.* Renee's baseline for language expansions was stable with just two of the 18 baseline points outside 50% of the mean ( $M = 0.6$ ). After intervention, however, Renee showed just a slight level change between baseline at 0.5 and intervention 0.6 with a trend line at the same level, and no change between the baseline ( $M = 0.6$ ) and intervention means ( $M = 0.6$ ). Stability of Renee's intervention behavior indicated no variability and percent of non-overlapping data (PND) of 0% showed no effect for this tier.

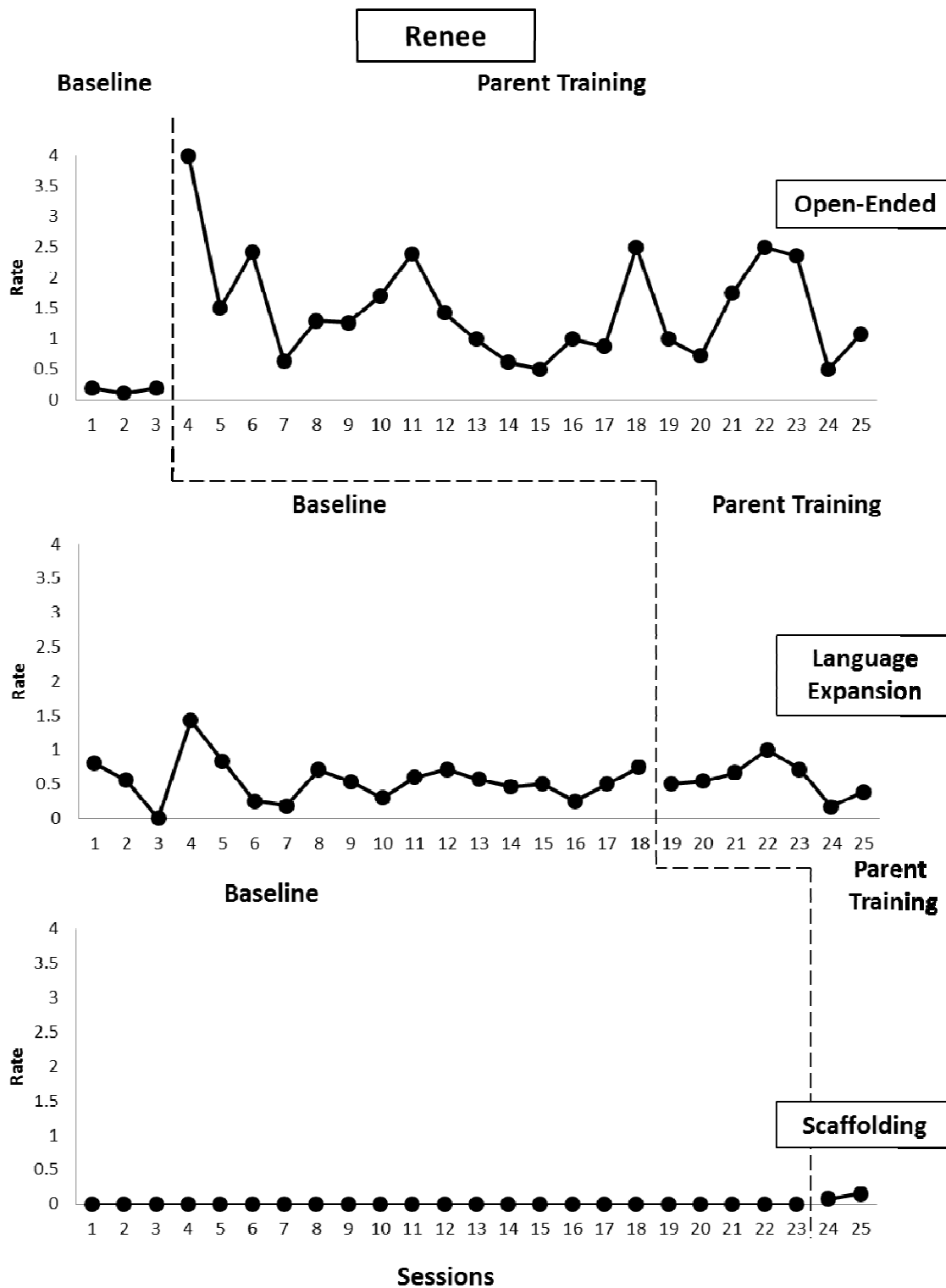


Figure 1. Renee's performance.

**Scaffolding.** Renee's mean baseline ( $M = 0$ ) for scaffolding demonstrated she did not use any scaffolding techniques during 23 sessions of baseline. After intervention, Renee's behavior for scaffolding increased, but she discontinued recording before enough data could be collected to draw conclusions about the effects of the intervention on her scaffolding behavior.

**Yes/No.** Information on Yes/No questions for Renee indicated that her rate did not change significantly as a result of the intervention.

**Conclusion.** Renee's average reading time during intervention was 10 minutes, and she completed 25 shared reading sessions. Although the Renee's rate of behaviors for open-ended questions increased, there was no effect for tier two and not enough data to draw conclusions about tier three. As such, there is no functional relationship between the intervention and changes in Renee's behavior.

**Parent-Child Dyad 2.** Patricia is a hearing woman who completed college. Her son, William, is 4 years, 4 months old with a PPVT score of 88. They exclusively use spoken language at home to communicate.

**Open-ended questions.** Visual inspection of Figure 2 showed Patricia's baseline was not stable and three of the five points were outside of 50% of the mean ( $M = 1.8$ ). Her mean rate of open-ended questions per minute of the sessions went down from baseline ( $M = 1.8$ ) to intervention ( $M = 0.7$ ). Visual inspection confirmed a trend rate going up in baseline but down during intervention. Patricia showed a wide range of variability during intervention ranging from 1.5 questions per minute above the mean to 0.7 below the mean. Patricia's percent of non-overlapping data (0%) showed the intervention was not effective for this tier.

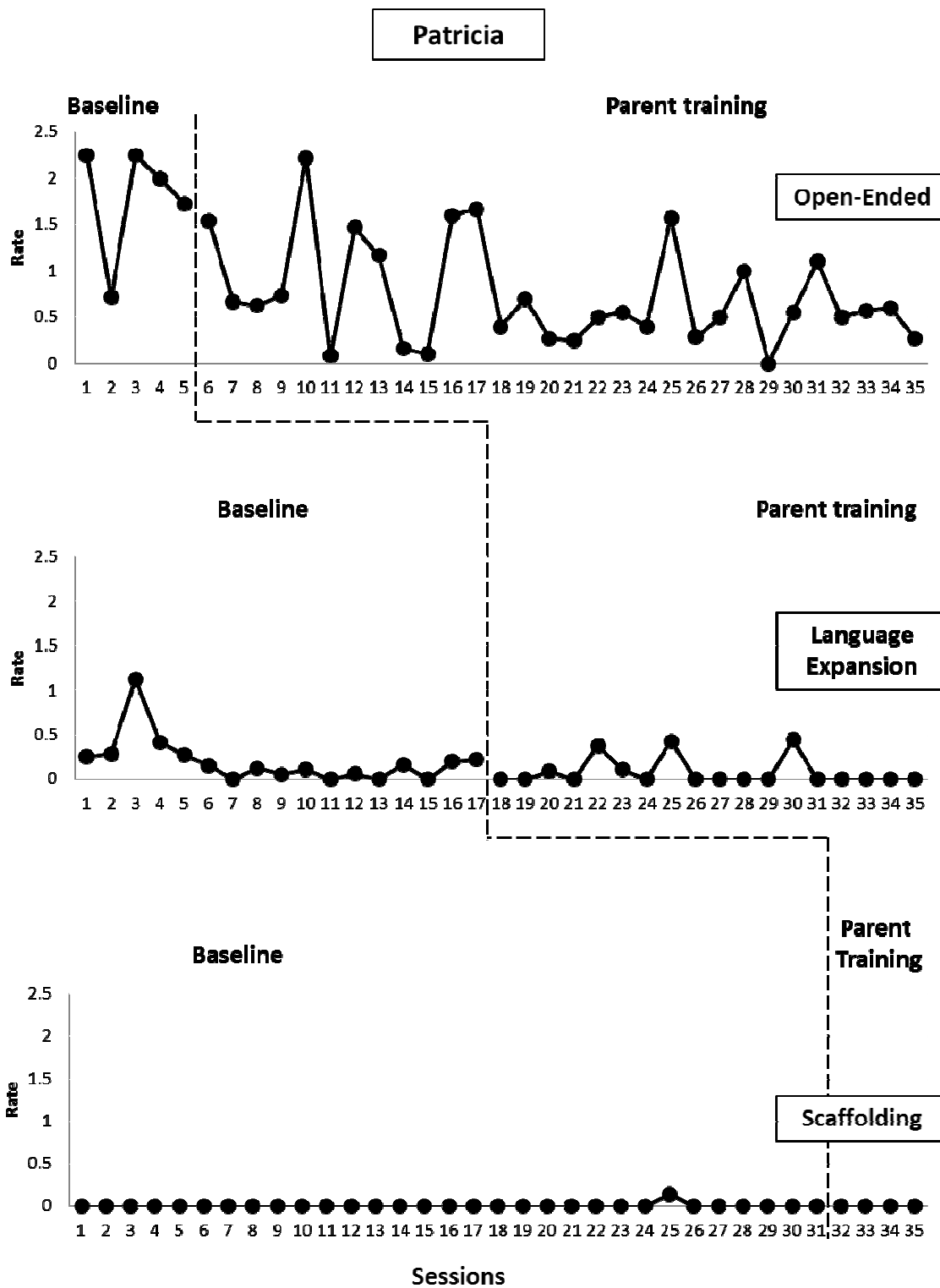


Figure 2. Patricia's Performance.

**Language expansions.** A similar pattern of variability emerged for language expansions. Baseline showed eight of the seventeen baseline points outside of 50% of the mean ( $M = 0.2$ ). Visual inspection showed a downward trend during baseline but also a downward trend during intervention. Patricia showed less variability in intervention but 13 of the 17 intervention points were at zero. Although Patricia did not use this strategy much prior to intervention, it is clear that there was no effect from the intervention on the rate of language expansions for Patricia.

**Scaffolding.** For scaffolding, Patricia did not use this strategy in baseline ( $M = 0$ ) and intervention had no effect on Patricia's use of the strategy ( $M = 0$ ). Although Patricia clearly participated in shared reading with her son- she averaged nine minutes per shared reading session and completed 35 reading sessions- the parent training intervention did not have an effect on her behavior for those sessions.

**Parent-Child Dyad 3.** Teresa is a hard-of-hearing woman who completed college. Her son, Derek, is 5 years, 3 months old, with a PPVT score of 59. They exclusively use spoken language at home to communicate.

**Open-ended questions.** Visual inspection of Figure 3 showed Teresa's baseline is stable and all points were within 50% of the mean ( $M = 0.1$ ). Her rate of open-ended questions increased after intervention, with a level change from 0.1 to 2.1, signifying a level increase of 2.0 open-ended questions per minute of session from baseline to intervention. Similar to Renee, Teresa showed a slightly descending trend line during intervention ( $M = 1.5$ ), but her progress was steady with variability holding stable with all but one data point within 50% of the mean. Her rate of open-ended questions never dropped below 0.5 questions per minute after intervention was introduced, which was

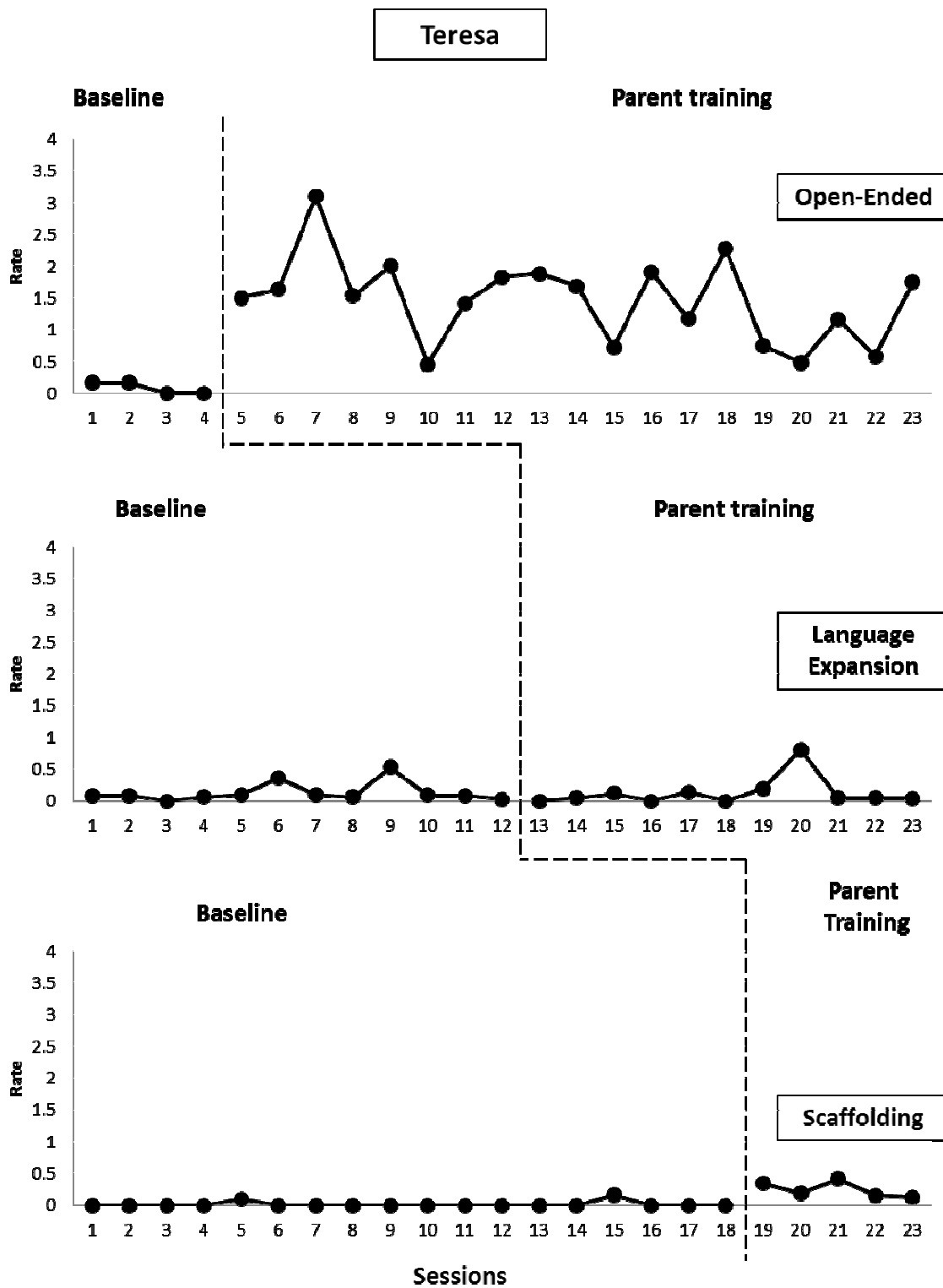


Figure 3. Teresa's Performance.

still a rate of 0.4 questions per minute above her baseline mean. As such, Teresa showed no overlapping data (100%) for this tier, indicating the intervention was highly effective for this tier.

***Language expansions.*** In a parallel pattern to Renee, Teresa's behavior for language expansions remained steady for baseline ( $M = 0.1$ ) but there was no change between baseline and intervention ( $M = 0.1$ ). Visual inspection showed a trend line increase for intervention but a baseline trend line going in the same direction. There was no effect on Teresa's behavior at this tier.

***Scaffolding.*** Teresa's mean baseline ( $M = 0$ ) for scaffolding demonstrated she did not use any scaffolding techniques during 18 sessions of baseline. After intervention, Teresa's behavior for scaffolding increased to a mean of 0.2 scaffolding behaviors per minute of the session. The level change for immediacy of effect was slightly higher and showed an increase from a rate of 0.0 per minute to a rate of 0.3 per minute of the session. Intervention trend line showed the behavior going in a decreasing direction and was stable with all points within 50% of the mean. The change in Teresa's behavior was slight, and correspondingly, the percent of non-overlapping behavior was 40%.

***Yes/No.*** Information for Teresa shows that her rate of yes/no question increased slightly from baseline to intervention. Her baseline behavior was stable with all points within 50% of the mean. Her rate of yes/no questions increased from 0.2 questions per minute to 0.5 questions per minute during intervention. The level change went from a rate of 0.1 to 0.7 during intervention. Intervention data was stable, but with just 5% of non-overlapping data, no conclusions can be drawn about changes in behavior as a result of the intervention.

**Conclusion.** Teresa's average reading time during intervention was 19.2 minutes, and she completed 23 shared reading sessions. Teresa showed similar results as Renee and displayed a dramatic increase in her rate of open-ended questions, but for language expansion there was no change and for scaffolding there was a very slight change. As such, this intervention did not effectively change Teresa's behavior during shared reading.

**Parent-Child Dyad 4.** Kirsten is a hearing woman who completed a post-graduate degree. Her daughter, Bryson, is three years, 5 months old with a PPVT score of 79. They exclusively use spoken language at home to communicate.

**Open-ended questions.** Visual inspection of Figure 4 showed Kirsten's baseline was not stable and two of the three points were outside 50% of the mean ( $M = 0.8$ ). Her rate of open-ended questions increased after intervention, with a level change from 0.8 to 2.3, signifying a rate increase of 1.5 open-ended questions per minute of session from baseline to intervention. Kirsten showed a slightly descending trend line during intervention ( $M = 1.3$ ), and stable variability with just four of the 39 intervention points outside 50% of the mean. Her mean rate of open-ended questions during intervention was 0.5 questions per minute above her baseline mean and dropped to pre-intervention mean only three times. However, Kirsten's percentage of non-overlapping data (21%) showed some overlap for this tier.

**Language expansions.** Kirsten's baseline for language expansions was stable with no points outside 50% of the mean ( $M = 0.1$ ). After intervention, Kirsten's language expansion behavior actually dropped between baseline ( $M = 0.1$ ) and intervention

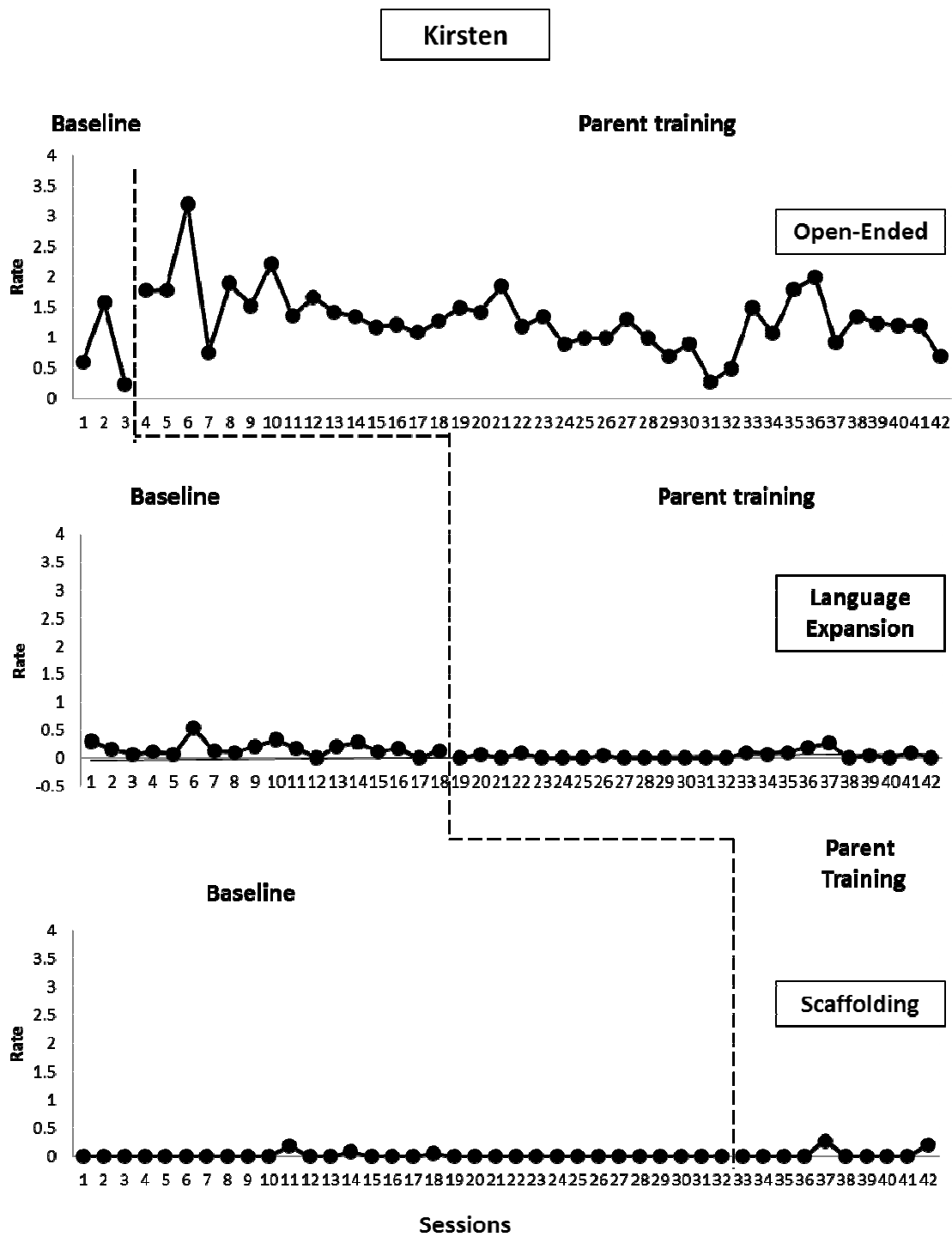


Figure 4. Kirsten's Performance.

( $M = 0.05$ ). Stability of Kirsten's intervention behavior indicated very little variability. There was no effect for this tier.

**Scaffolding.** Kirsten's mean baseline ( $M = 0$ ) for scaffolding demonstrated she used no scaffolding techniques during three sessions of baseline. After intervention, Kirsten's behavior for scaffolding showed a very slight change with an intervention mean at 0.05. Results indicate minimal change in behavior from baseline to intervention as a result of the parent training.

**Yes/No.** Information for Kirsten shows that her rate of yes/no question increased slightly from baseline to intervention. Her baseline behavior was not stable with two of the three points outside 50% of the mean. Her mean rate of yes/no questions increased from 0.4 questions per minute to 0.6 questions per minute during intervention. The level change went from a rate of 0.4 during baseline to 1.4 during intervention. Intervention data was somewhat stable, with nine of the 39 points outside 50% of the mean. Twenty one percent of her data did not overlap. These results indicate a slight increase in yes/no behaviors as a result of the intervention.

**Conclusion.** Kirsten's patterns of behaviors matched Renee and Teresa. Kirsten showed an immediate effect for open-ended questions with a level increase of 1.5 open-ended questions per minute of the session from baseline to intervention. Kirsten's average reading time was 16 minutes and she completed 42 shared reading sessions. Just as with Renee, Teresa and Patricia, there was no effect for language expansions. Kirsten showed a very slight increase in scaffolding and her percent of non-overlapping data was 20% for scaffolding. Although open-ended questions showed some effect, the parent training intervention was not effective to change Kirsten's behavior.

**Summary of the Four Participants.** The results of these data suggest that the *Lunch Bunch* parent trainings was not an effective program to change behavior of parents with DHH children during shared reading. For open-ended questions, mean performance during baseline was a rate of 0.7 open-ended questions per minute (range 0.1-1.8) with a performance increase of a rate of 1.3 open-ended questions per minute (range 0.7-1.5). The mean performance for language expansion showed no effect for the intervention. The mean performance for scaffolding showed very minimal change with a mean rate of 0.0 per minute in baseline and an increase in rate to 0.09 per minute in intervention. While increases in open-ended questions showed strong effects for three of the four participants, single case design requires three demonstrations of the effect at different points in time to determine a functional relationship between the intervention and changes in behavior (Kratochwill et al., 2010). As such, this was not an effective intervention to change parent behavior during shared reading.

### **Social Validity**

Researchers used a social validity questionnaire to collect information from the participating mothers on their perception of the interventions, both the parent trainings as well as the shared reading strategies. Table 4 shows the results of the parent trainings questionnaire (Appendix C) and Table 5 shows the results of the shared reading questionnaire (Appendix D). Answers were measured using a Likert-type scale from 1 (*not at all true*) to 5 (*very true*).

Comments regarding the parent training intervention included, “[After the study] we read the same book for two weeks instead of one; he understands them more. And we’ll write down the words he doesn’t know in his [home/school] book” (Teresa). “I

Table 4

*Social Validity Results: Parent Training Intervention*

Item	Mean
The parent workshops were enjoyable for me.	5.00
The parent workshops improved my ability to read books with my child.	5.00
I am likely to keep using the storybook reading techniques I learned.	5.00
I am likely to use the techniques I learned during other times of the day when I'm interacting with my child.	4.50
I was easy to come to the school for the workshops.	4.50
I think the workshops were valuable.	4.75

Table 5

*Social validity questionnaire- Shared reading intervention*

Item	Mean
The storybook reading times were enjoyable for me.	4.75
The storybook reading times improved my child's literacy development.	4.50
I am likely to keep using the techniques used in the storybook reading times.	5.00
I am likely to recommend the storybook reading techniques I learned to a friend.	4.50
My child enjoyed the storybook reading times.	5.00
My child enjoyed the books used in the storybook reading times.	4.75
It was easy to fit storybook reading times into my week.	4.50
I think storybook reading is valuable.	5.00
My child and I did outside activities about the book we read.	3.25

wish the workshops were a little longer. It would have been easier to do the strategies at home” (Teresa). “[Our trainer] was awesome! I am so glad she introduced this method of reading and learning to us. We will most certainly be using it with our youngest daughter and any other children we may have” (Kirsten).

Comments regarding the shared reading intervention included, “Depending on the book, we sometimes did whatever the book was talking about” (Renee). “Sometimes [William] didn’t like having the same book over and over” (Patricia). Patricia also said, “I would change the time of day when the workshops were being presented because it was difficult to stay there during that time”. “The Stone Soup book gave [Bryson] an even more keen interest in cooking and the kitchen. We subsequently ‘cooked’ a variety of soups with many different ingredients. This led her to ask for a kitchen of her own from Santa. Santa granted her wish, and she now happily plays away making many weird and wonderful dishes for the whole family to share. These include strawberry and cinnamon soup, soup with pasta, carrots, mustard and chocolate, and one of my favorites, veggie burger mix, cauliflower, and apple sauce soup” (Kirsten).

### **Conclusions**

Findings are interpreted in terms of the four research questions I attempted to address in this study.

#### **1. Can parents with DHH children learn to use open-ended questions during shared reading?**

Open-ended questions included wh-questions, fill-in-the-blank prompts, and either/or questions. There was a difference between baseline and intervention for three of the four parents. For Renee, Teresa, and Kirsten, who all increased their rate of open-

ended questions, there was an immediate effect with a mean level at baseline of 1.1 per minute of the session increasing to 2.0 open-ended questions per minute of the session. Furthermore, these mothers' rates of open-ended questions stayed consistently higher than their highest baseline rate, which demonstrates a positive, lasting effect as a result of the parent training.

However, there was variability in the mothers' rate of open-ended questions during intervention (20%) which may have occurred as a result of the repeated reads. Repeated reading encourages parents to read a book at least three times or more so that children can begin to understand the language and vocabulary of the story (Whitehurst, 1992). The mothers may have spent the first reading of the story focused on the text while gradually asking more questions in the third and fourth read as their child gained a better understanding of the story. Also, while parents were encouraged to choose books at an age- and language- appropriate level, the books chosen ranged from repetitious board books (i.e., *Napping House*, by Audrey Wood, HMH Books) to storybooks with complex narratives (i.e., *Click Clack Moo, Cows that Type*, by Doreen Cronin, Little Simon). Based on the results of the social validity questionnaire, the mothers agreed that their children enjoyed the storybooks chosen; however, there may be more description or clarification needed for certain types of books than others, which could have led to differences in the amount of questions asked. Another explanation that fits the pattern of the graphs was that, when the parents were trying to integrate a new strategy, rate of open-ended questions dropped, which appeared on the graphs shortly after each training.

For Patricia, who showed consistent behavior with virtually no change throughout the study, variability for her rate of open-ended questions was significant for both

baseline and intervention phases. Patricia did not attend two of the three parent trainings in person but did participate in make-up sessions. However, her attendance may not be the only explanation because she did attend the first training and still showed very inconsistent behavior for open-ended questions. When coding Patricia and William's audiorecordings, researchers noticed that much of their interactions took place as conversational turns. For example, William asked a lot of questions during their shared reading, and Patricia provided answers to those questions rather than the other way around. Research supports the efficacy of this type of interaction (VanDam, Ambrose, Moeller, 2012), and, with William's vocabulary scores in the average range, perhaps Patricia did not see any reason to change her behavior.

## **2. Can parents learn to use language expansions during shared reading?**

All four mothers showed virtually no change in their rates of language expansion during shared reading. The parent trainings were not an effective tool to help them implement this strategy. Moreover, while this is an effective tool to help build language in DHH children (DesJardin et al., 2008), Teresa and Patricia almost never used it. Renee's use of this strategy was more consistent and, even though her rate did not change as a result of the intervention, she still showed a mean rate of 0.6 language expansions per session. Kirsten's use of the strategy was consistently low during baseline and dropped during intervention. While interactive shared reading programs like dialogic reading encourage the use of the language expansion strategy in addition to questioning, very few researchers isolate the language expansion strategy apart from questioning behavior to examine the effects of the intervention (Pemberton & Watkins, 1987). Additionally, research studies consistently used short, generic training sessions as shown

by a meta-analytic review of 16 parent-child intervention studies which averaged a little over three hours for parent training (Sénéchal & Young, 2008) with some studies showing effects with no interaction with the parents beyond a videotaped training (Huebner & Meltzoff, 2005). The only study using DHH children as participants gave parents a heavy level of support during the intervention through the use of materials but did not provide extensive training up front (Fung et al., 2005). The current study's total training time was 4 and ½ hours, and parents received individual guided feedback at the end of the training session while they practiced with their child as well as additional materials to individualize the strategies based on the language level of their child.

Outside of shared reading, research with parents of hearing children with language impairments suggests that this particular strategy may need substantially more effort to change behaviors (DesJardin, 2006; Hancock, Kaiser, & Delaney, 2003; Kaiser & Hancock, 2003). Hancock et al. (2003) increased parents' use of language expansions 10% from baseline to intervention but required 30 individual sessions to see those results. For families with DHH children, this type of individual training is typical in the birth to three years during early intervention. However, once DHH children are older than three years of age, individual training with parents may be cost prohibitive outside of a therapeutic setting. DesJardin (2006) also noted another factor that is related to outcomes for language expansions; mothers' self-efficacy beliefs and perceptions of involvement, which are positively associated with language expansions. Expectations for seeing change related to this strategy may have been too ambitious considering the context of the training.

For Patricia, much as with the other tiers, there was no change in her behavior for language expansions. Again, based on the audiorecordings, researchers noted that Patricia used communication repair strategies such as asking questions (i.e., “What did the boy do?”) as well as rephrasing William’s statements through questions. For example, in one instance William said, “Llama red pajama” and Patricia said, “He’s wearing his red pajamas, isn’t he?” Patricia had a particular strategy to rephrase or expand through an affirmation question (referred to grammatically as a tag question). Our coding system was consistent with other studies’ coding schemes that operationalized this behavior as when the parent repeated their child’s utterance and expanded it with semantic or syntactic information (Hancock, Kaiser, & Delaney, 2002; Taverne & Sheridan, 1995). However, our coding scheme was not broad enough to include questions as language expansions. Furthermore, affirmation questions in particular were not coded as language expansions because they also served several other purposes for these mothers. For example, affirmation questions served as a means to encourage children to keep talking (Kirsten: “That’s so silly, isn’t it?”), to provide answers to questions (Renee: “There are four birds, aren’t there?”), and to introduce new vocabulary (Kirsten: “That’s preposterous. Preposterous means the same thing as silly, doesn’t it?”).

The results of the study suggest that the coding system needs to be a more sensitive measure to capture all of the strategies the mothers are utilizing for the purpose of examining their use and effectiveness. The graphs suggest that a different coding scheme would not have changed the outcome for this tier, language expansion behavior, but it is worth noting that future studies should more carefully identify the role of affirmation questions and how their multiple purposes are captured through coding.

### **3. Can parents learn to scaffold?**

Patricia showed no change in behavior related to scaffolding. Renee, Kirsten, and especially Teresa showed some increase in scaffolding behavior but the effect was not significant. Teresa's rate of scaffolding increased from 0.0 during baseline to a rate of 0.2 scaffolded questions per session during intervention. Renee increased from 0.0 to a rate of 0.1 scaffolded questions per session. The scaffolding intervention condition was, on average, shorter than the other conditions for all four mothers. General fatigue with the intervention may have influenced the duration of the scaffolding condition, as well as a desire to return to a schedule more suited to their child's needs. All of the mothers said they continued with the intervention in the social validity questionnaire. However, all four mothers also stated that, post-intervention, they made changes to the intervention to make it better suited for their child. Renee stated that, since her daughter Erika was learning some beginning reading skills, Erika wanted to spend more time reading early books rather than having her mother read to her. Renee felt that Erika needed to have the freedom to choose, so Renee read when Erika was in the mood. Patricia said that William began to tire of reading the same book over and over. Teresa said that her son Derek needed to read the same book for two weeks instead of one to really understand the story. Kirsten said that she liked to target vocabulary in the stories and create activities around the concepts and words in the book. By the ninth week when scaffolding was introduced, the mothers stated they were ready for a little bit more freedom to modify the intervention as they saw fit.

#### **4. Does introduction of strategies change the rate per minute of yes/no questions?**

The research literature correlates open-ended questions to better language outcomes for DHH children. However, (DesJardin, 2006) reported that mothers' self-efficacy was positively correlated to language expansions, open-ended, *and* yes/no questions. All four mothers increased their mean level rate of yes/no questions (range 0.2-1.0). It appears that, as mothers' rate of open-ended questions increased, so did their rate of increase for yes/no questions. Much like affirmation questions (which were not coded), the purpose of yes/no questions varied as evidenced by the audiorecordings of the sessions. Kirsten and Patricia, both of whom had children with vocabulary scores in the average range, used yes/no questions to encourage continuation of the conversation ("Ready? Are you ready?"), Teresa used the behavior as an attention-seeking measure ("Are you listening to me?"), and Renee and Teresa used them to simplify questions ("Is he afraid? I think he's afraid"). Again, the coding scheme did not capture these nuances with yes/no questions because any questions outside the story were not coded. When scaffolding, using yes/no behavior to simplify questions does not provide as much information as either/or questions, but it does provide an opportunity to model unknown language and vocabulary.

Kirsten used yes/no questions to scaffold in a different way than how it was taught in the parent training. The parent training taught the parents to start with an open-ended question and then use "safety nets" to simplify the question if their child could not answer. Instead, Kirsten started with a yes/no question (i.e. "Do you think the momma bird was happy with Stellaluna or angry with her?") and then she would expand on the

same question by saying [in response to Bryson's answer], "Why do you think that?" Kirsten did this several times in the scaffolding condition. Our coding scheme was not sensitive enough to identify all of the nuances displayed by the four mothers using yes/no questions, but the parent training intervention did appear to encourage use of yes/no questions for various purposes.

### **Limitations**

General limitations for the present study are related to the multiple-baseline single subject design. Researchers made a decision to measure the effects of the study across content because the ecological, community context of the parent training intervention made delayed treatment impracticable. However, the strategies may have been too dissimilar to present an identical level of effort. A strategy such as language expansion may require more individual training that is tailored to the parents' conversation style and language level of the child (Kaiser & Hancock, 2003). A strategy like open-ended questions may be simplistic enough to present in a short training session. One of the parents, Teresa, noted that she felt that the training sessions were too short, and she would have been better equipped to implement the strategies if she had had more time to practice and learn about the strategies. Also, the length of the study, without giving the parents the freedom to self-modify the intervention, may have prompted intervention fatigue.

Another limitation to the study was the sensitivity of the coding scheme to capture nuances and strategies that may already be effective for facilitating language. Affirmations and yes/no questions were operationalized too simplistically (or not at all) to capture the nuances and dual purposes of these types of questions. The mothers used

several strategies to encourage conversation that also were not captured in this study. Finally, researchers collected data for the dependent variables at three to four different points in a story read of repeated readings, which may have contributed to the variability of behaviors. As stated before, complex storybooks may require more description or explanation and repetitious books may need less, so outcomes of the behavior appeared variable due to the subject matter.

### **Implications for Further Research**

Single-case design allowed researchers to observe a great deal of individualized information regarding the strength of the parent training intervention. While the design did add limitations to the study, it may continue to be an informative design to isolate the type and intensity of training for effective practices. Future studies could draw from the work of previous researchers such as Kaiser and Hancock (2003) who recommended strategies and practices for individualizing parent training with children who have language delays. Inclusion of these practices, such as creating an individualized plan and individual training with the parent and child (Kaiser & Hancock, 2003), as well as work to promote self-efficacy and parent involvement (DesJardin, 2006), could be incorporated into an existing early intervention program. Early intervention programs for DHH children are already designed to work individually with the family and create a plan to facilitate language development. Because early intervention is not mandated past three years of age, more focused efforts on language expansion and scaffolding techniques during the early intervention period could help parents feel and be more effective long term. Research efforts can work within these programs, possibly using single-case research designs, to closely examine the intensity needed to create change.

While language expansion behaviors seemed to require a more intense focus, open-ended questions showed immediate and sustainable growth for three of the four participants. A second area of future research could corroborate the effects of this study for open-ended questioning behaviors by isolating this one strategy and replicating the effects through a delayed treatment design. Despite the fact that the current study did not show a functional relationship all of the strategies taught in the parent trainings, the effects for open-ended questions certainly show promise and replication would be necessary to justify using this type of training in practice. One final area of future research could be a longitudinal study to examine acquisition and maintenance of language facilitation behaviors during shared reading and relate those changes in behaviors to outcomes in literacy. In other words, authors have already identified which of these behaviors are predictor variables (DesJardin et al., 2008), but future research could assess the effects of an intervention and measure any resulting changes on children's literacy skills and parent behavior in the long term.

### **Summary**

The research on shared reading with DHH children suggests that, while shared reading is a salient strategy for hearing children to improve language skills, parents with DHH children may not have the necessary skills to transfer those strategies easily to their households and additional training may be necessary to be effective (Stobbart & Alant, 2008; Swanwick & Watson, 2005). In particular, the current study's research team identified open-ended questioning, language expansions, and scaffolding as three strategies that could significantly change language and literacy outcomes for DHH children (DesJardin et al., 2008). In the current study, a parent training intervention was

implemented that targeted these strategies alongside some general shared reading strategies using a 12-week single-case, multiple baseline design across strategy. Results indicated effects for open-ended questioning behaviors but showed no change for language expansions and minimal change for scaffolding; thus, this study showed no functional relationship between the intervention and the outcomes in behavior. These three strategies may require different levels of instruction and intensity, such as individual versus group training, and the study design may be a limitation to drawing definitive conclusions regarding the effects of the intervention. However, the effects on open-ended questioning behavior are a promising beginning for future research, and there is potential for replication. Findings of the current study suggest that shared reading is a promising practice to facilitate language development in DHH children but researchers and practitioners still need more information on the most effective ways to develop these strategies in families with DHH children who use the practice.

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## APPENDIXES

## APPENDIX A



*towards grade  
level reading &  
writing. . .*

## Home Connection

***Reading to your child at home can help build the language necessary for reading comprehension.***

- ◊ Set up a reading area that is quiet & free of noise and distraction
- ◊ Read the same book at least 4 times a week
- ◊ Choose a book where your child knows most but not all of the words
- ◊ Choose a few vocabulary words or ideas you'd like to work on for the week and ask open-ended questions



# Asking Open-Ended Questions

- ◊ **Push in** language -tell your child what a word or idea is or what it means
- ◊ **Pull out** language -give your child a chance to say something about the word or picture.

Ask questions to push in & pull out language:

*What's he wearing?*  
*What's that?*  
*Where is she going?*  
*What's this for?*  
*What's happening here?*  
*How did he get there?*  
*What's going to happen next?*  
*How does that work?*  
*Why was he disappointed?*  
*Who took her bear?*  
*What made her happy?*  
*How far will he go?*

*You can push in language to teach new words & when your child doesn't know the answer*

What is a **habitat**? A habitat is a place where animals live.

?

**Extension**

Carry over words or ideas to something your child knows at home. For example, after reading *The Very Hungry Caterpillar* by Eric Carle, go outside look for other insects.



## APPENDIX B

**101 Tier 2 Words**

1. **Abundance**- more than enough of something
2. **Admire**- to like the way something looks
3. **Advice**- what you think someone should do
4. **Annoy**- to bother
5. **Appear**-to show up
6. **Arrange**- to put something in order
7. **Arrive**- to get somewhere
8. **Assist**- to help
9. **Astonished**- very surprised
10. **Attentive**- pay attention
11. **Available**- ready to be used
12. **Avoid**- stay away from
13. **Brief**- a short time
14. **Cautious**- careful
15. **Collect**- to get things together; to pick up things that belong together
16. **Combine**- to mix or put together
17. **Comfort**- to make feel better
18. **Comfortable**- to feel good
19. **Communicate**- to let someone know what you think or feel
20. **Compare**- to see how things are alike and different
21. **Complete**- finish
22. **Concentrate**- to think about something really hard
23. **Concerned**- worried
24. **Confused**- when you don't understand
25. **Contain**- to have or hold something inside
26. **Corner**- the point where 2 sides come together
27. **Correct**- right
28. **Create**- to make
29. **Curious**- want to know
30. **Dangerous**- not safe
31. **Delighted**- happy
32. **Demonstrate**- to show how to do something
33. **Describe**- to tell about something
34. **Destroy**- to tear up; to ruin
35. **Determined**- to keep working at something until you get what you want; to not give up
36. **Difficult** -hard to do
37. **Disappear**- to go away
38. **Disappointed**- upset because things did not work out the way you wanted them to

39. **Discover**- to find out about something
40. **Dispose**- to throw away; get rid of
41. **Eager**- really ready for something to happen
42. **Edible**- you can eat it,
43. **Enormous**- really big
44. **Entire**- the whole thing; all of something
45. **Envy**- want what somebody else has
46. **Equal**- the same as
47. **Event**- something that happens
48. **Except**- all but
49. **Excited**- really happy about something; having a lot of energy
50. **Expect**- to think something will happen
51. **Expensive**- cost a lot of money
52. **Extraordinary**- really special; very different and wonderful
53. **Familiar**- you've seen it before or you already know it
54. **Famous**- known by a lot of people
55. **Fancy**- really special
56. **Favorite**- the one you like best
57. **Fewer**- not as many
58. **Fragile**- breaks or gets hurt easily; not strong
59. **Frustrated**- feeling upset when you keep trying to do something but it doesn't work
60. **Identical** – the same in every way; exactly the same
61. **Ignore**- not pay attention to
62. **Imitate**- do the same thing somebody else does
63. **Immense**- really big; huge
64. **Impossible**- can't be done
65. **Introduce**- to show for the first time; to meet for the first time
66. **Invisible**- you can't see it
67. **Locate**- to find
68. **Marvelous**- wonderful
69. **Observe**- to watch carefully
70. **Occupied**- being used by someone else
71. **Ordinary**- plain; regular; not special
72. **Organize**- to put in good order
73. **Patient**- to wait nicely
74. **Peculiar**- strange
75. **Pleased**- happy with something
76. **Plenty**- a large amount; a lot
77. **Popular**- liked by a lot of people
78. **Predict**- to say or to guess what is going to happen
79. **Problem**- when something goes wrong
80. **Protect**- to keep safe

81. **Protect**- to keep safe
82. **Proud**- to feel good about yourself; to feel good about something you did
83. **Purchase**- to buy
84. **Recall**- to remember
85. **Remain**- to stay
86. **Remove**- take away
87. **Repair**- to fix
88. **Repeat**- to do again
89. **Ridiculous**- very silly
90. **Select**- to choose
91. **Separate**- take apart
92. **Similar**- the same in some ways but not all
93. **Simple**- easy to do
94. **Solution**- a way to fix something that went wrong
95. **Supplies**- things you need
96. **Transfer**- to move from one place to another
97. **Unusual**- different; really special; not familiar
98. **Useful**- can be used a lot
99. **Vanish**- to go away fast
100. **Variety**- different kinds of one thing
101. **Visible**- you can see it

## APPENDIX C

**Parent Workshop Questionnaire**

Please respond to the following questions

<b>1= Not at all true</b>	<b>2= Somewhat false</b>	<b>3= Neither true or false</b>	<b>4=Somewhat true</b>	<b>5=Very true</b>
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1. The parent workshops were enjoyable for me. \_\_\_\_\_
2. The parent workshops improved my ability to read books with my child. \_\_\_\_\_
3. I am likely to keep using the storybook reading techniques I learned. \_\_\_\_\_
4. I am likely to use the techniques I learned during other times of the day when I'm interacting with my child. \_\_\_\_\_
5. It was easy to come to the school for the workshops. \_\_\_\_\_
6. I think the workshops were valuable. \_\_\_\_\_
7. The thing I liked most about the parent workshops:  
\_\_\_\_\_
8. The thing I liked least about the parent workshops:  
\_\_\_\_\_
9. I would change \_\_\_\_\_ about the parent workshops.
10. What I learned  
\_\_\_\_\_

## APPENDIX D

**Storybook Reading Questionnaire**

Please respond to these questions.

1= not at all true	2=somewhat false	3=neither true or false	4= somewhat true	5- very true
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1. The storybook reading times were enjoyable for me. \_\_\_\_\_
2. The storybook reading times improved my child's literacy development. \_\_\_\_\_
3. I am likely to keep using the techniques used in the storybook reading times. \_\_\_\_\_
4. I am likely to recommend the storybook reading techniques I learned to a friend. \_\_\_\_\_
5. My child enjoyed the storybook reading times. \_\_\_\_\_
6. My child enjoyed the books used in the storybook reading times. \_\_\_\_\_
7. It was easy to fit storybook reading times into my week. \_\_\_\_\_
8. I think storybook reading is valuable. \_\_\_\_\_
9. My child and I did outside activities about the book we read \_\_\_\_\_

a. If yes to #9, please describe activities:

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Comments: