



2014

Social-Emotional Development in Children with Hearing Loss

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SOCIAL-EMOTIONAL DEVELOPMENT IN CHILDREN WITH HEARING LOSS

THESIS

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in the College of Health Sciences at the University of Kentucky

By

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Lexington, Kentucky

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2014

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ABSTRACT OF THESIS

SOCIAL-EMOTIONAL DEVELOPMENT IN CHILDREN WITH HEARING LOSS

Many positive outcomes have been documented for children with hearing loss utilizing current treatment approaches such as early identification and intervention, including appropriately fit sensory devices and communication modes that focus on listening and spoken language. However, challenges related to social-emotional development have been widely observed. The development of communication skills in children with hearing loss is impacted by many factors, including the degree of hearing loss, the child's age at onset and identification, the presence of other disabilities, and when the child receives intervention. While there are a variety of therapeutic options available for children with hearing loss to develop communication skills, listening and spoken language is of particular interest to parents with normal hearing. In addition to affecting social competence and participation, problems with social-emotional development are linked to poor academic performance. This study examined the social-emotional development of a small group of young children who communicated using listening and spoken language as measured by parent and caregiver report. Three psychosocial scales were used to evaluate the children's social-emotional development in comparison to peers. These results were analyzed within the context of other demographic variables. One of the five children was identified as facing problems with social-emotional development.

KEY WORDS: social-emotional development, psychosocial development, children with hearing loss, listening and spoken language, communication disorders.

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May 2, 2014

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ACKNOWLEDGEMENTS

The following thesis would not have been possible without the guidance and support of several people. First, my Thesis Chair, Dr. Anne Olson, has served as a wonderful mentor and role model. Her guidance proved invaluable throughout every stage of the thesis process. Additionally, Dr. Olson's Aural Rehabilitation course provided a strong knowledge base and inspired an interest that served as the foundation for my thesis. I would also like to thank my Thesis Committee members, Dr. Joneen Lowman and Dr. Jane Kleinert, for their insight and direction. I know that my work has greatly benefited from their knowledge and feedback.

In addition, I would like to sincerely thank my family and friends for their support throughout this process. My parents, Leslie and Gayle Harris, and brother, Tyler, have always encouraged and supported me in my pursuit of knowledge. My friends were always available to offer words of encouragement and help me laugh even in the most stressful moments. Additionally, I would like to thank the Lexington Hearing and Speech Center for their instrumental input, as well as the participants of this study. My study would not have been possible without their contributions.

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Chapter 1

Background

Social-emotional development (SED) consists of the skills children develop to interact with others. SED was notably described by psychologist Erik Erikson. Erikson believed that personality develops in a series of eight stages over a lifetime. In each stage, the individual must overcome a psychological conflict which helps form their own identity (Erikson, 1964). If individuals fail to achieve a balance during each stage, their self-concept can be affected later in life. For example in stage 1 (Trust vs Mistrust), infants develop a sense of dependence towards parents or caregivers through regular feeding, nurturing and play experiences. Without consistent care and interaction, infants may fail to achieve a reliable sense of trust which can negatively impact later social relationships. Therefore the social interactions acquired throughout childhood help shape a child's identity. This is important because a competent sense of self is critical to developing appropriate skills that underlie a person's behavior as well as their achievements (Erikson, 1964).

Importance of Social-Emotional Development

Social-emotional development has been widely shown to predict a wide variety of issues including mental health, substance abuse, aggression, academic achievement, and even job performance (Denham, Zahn-Waxler, Cummings, & Iannotti, 1991; Tremblay, 2000). For example, adequate SED has been linked to early academic success for young children (Raver, 2002). In contrast, children who present with emotional difficulty can face the risk of academic failure. Additionally, mastery of peer social competence

continues and facilitates the academic and social success of young students as they progress throughout school (Hampton & Fantuzzo, 2003). Furthermore, children who obtain peer acceptance at school indirectly experience other positive benefits, such as increased likelihood of positive self-perception and increased academic performance (Flook, Repetti, & Ullman, 2005). In sum, it appears that SED is crucial to an individual's academic success and future mental health. To date the plethora of research in social-emotional development has been described based on the abilities of children with normal hearing. However it would appear that social-emotional development in children at risk is also critical.

Hearing Loss and Social-Emotional Development

Previous research has indicated that children with hearing loss may face unique difficulties with mastering SED (Meadow & Dyssegaard, 1983). While the prevalence of such problems is unknown, some reports suggest that difficulty with SED may range from 8% (Hintermair, 2007) to 41.3% (Van Eldik, Treffers, Veerman, & Verhulst, 2004). The underlying causes of such SED may be linked to communication challenges and potential language delays which often occur in children with hearing loss (Eisenberg, 2007). Specifically, hearing loss can negatively affect a person's ability to communicate with others thereby impacting the quality of social interactions. Therefore it is not surprising that SED challenges can occur in children with hearing loss given that language is a social tool that individuals use to communicate with others. Furthermore, if the listening environment is poor or if children are unable to adequately recognize an auditory signal then minimal interaction between students with hearing loss and normal hearing peers is likely (Antia & Kreimeyer, 1996). Additionally, even if students do hear

the auditory message, they still may not understand the linguistic nature of the signal thus further limiting the opportunity for appropriate interactions to occur. Some research has suggested that preschoolers with hearing loss have greater difficulty maintaining attention and thus are unable to sustain interactions long enough for a social exchange to even take place (DeLuzio & Girolametto, 2011). This reduced interaction may also be due to inappropriate pragmatic uses by persons with hearing loss, decreased perception of emotion, inadequate strategies to gain access to a group, or multiple failed communication initiations (Most & Michaelis, 2012; Most, Shina-August, & Meilijson, 2010; Remine & Brown, 2010; Brown, Remine, Prescott, & Rickards, 2000). Regardless of the precise underlying cause of reduced interactions, children with hearing loss would appear to be at risk for SED issues.

Equally important is that increased parental stress has been reported by parents of children who are deaf and hard of hearing who present with social-emotional problems (Hintermair, 2006). For example, in a study of mothers of toddlers with congenital hearing loss, increased maternal stress was predicted by the total number of behavior problems exhibited by their child, after controlling for hearing loss, length of stay in the Neonatal Intensive Care Unit, and SES (Topol, Girard, St Pierre, Tucker, & Vohr, 2011). This may occur because parents experience increased daily challenges related to child behavior issues (Pipp-Siegel, Sedey, & Yoshinaga-Itano, 2002). The increased stress could negatively affect that quality of life of families with a child who is deaf and/or hard of hearing. Therefore SED is likely a very important domain to consider at some point when providing services for families of children with hearing loss, especially considering that children transition from one setting to another. During such transitions many changes

can occur such as the teacher, peers, routines, environments and material being taught which could negatively impact the ability of children with hearing loss to continue developing social emotional skills.

A variety of factors influence communication development in children with hearing loss. These factors include the degree of hearing loss, the age of onset, the age of identification, the presence of other disabilities and time of intervention (Sininger, Grimes, & Christensen, 2010; Vohr et al., 2012). Universal newborn hearing screening (UNHS), currently mandated in most states, has reduced the median age of identification of hearing impairment from 12-18 months to 6 months or less (Green, Gaffney, Devine, & Grosse, 2007). Early identification of hearing impairment may improve language outcomes and subsequent academic and social-emotional well-being (Fitzpatrick, Durieux-Smith, Eriks-Brophy, Olds, & Gaines, 2007; Yoshinaga-Itano, 1999). Several of these studies evaluating social-emotional skills are limited in their scope of measurement technique and therefore Moeller (2007) has stressed the importance of purposefully exploring this domain more closely. Finally, given the trend in education of children who are deaf or hard of hearing being placed in mainstream settings (Powers, 2001), greater understanding of the role of SED in addition to speech and language abilities would seem to be an important area of investigation.

The purpose of this pilot study is to describe the SED abilities in children (3-6 years of age) with hearing loss who use a listening and spoken language approach (LSL) for communication and have been fit with amplification. Currently there is minimal evidence about the social-emotional status of children with hearing loss who use LSL. The majority of current research focuses on outcomes related to speech and language

production, speech perception, and overall academic and literacy skills (Dornan, Hickson, Murdoch, & Houston, 2007). Denham, Wyatt, Bassett, Echeverria and Knox (2009) emphasize that studies of development should consider an individual's cognitive and maturational changes that occur over time. This suggests that in studies of children with hearing loss there is a crucial need to more systematically and more routinely describe SED and monitor these skills. This study will use a case series design evaluating SED in a convenience sample of children with hearing loss within the context of other demographic data.

Chapter 2

Review of the Literature

There are several early studies in childhood hearing loss that evaluated SED (Chovan & Roberts, 1993; Kluwin, Stinson, & Colarossi, 2002; Lytle, Feinstein, & Jonas, 1987; Matson, Macklin, & Helsel, 1985; Meadow & Dyssegaard, 1983). These studies included children who were identified closer to preschool age and who used sensory management technologies that lack the sophistication of today's devices. Given the advent of newborn hearing screening programs, the average age of identification of hearing loss has decreased (Yoshinaga-Itano & Sedey, 1998), so that today's children with hearing loss represent a very different population than previous cohorts. Furthermore, children with hearing loss now have opportunities to access sound through cochlear implantation and digital amplification systems. Improved speech and language abilities are widely documented for this population of children with hearing loss (Fulcher, Purcell, Baker, & Munro, 2012; Geers & Sedey, 2011; Miyamoto, Houston, Kirk, Perdew, & Svirsky, 2003; Svirsky, Robbins, Kirk, Pisoni, & Miyamoto, 2000; Yoshinaga-Itano, 1999). In fact, some research suggests that outcomes in terms of language abilities may be close or equal to same age peers (Fulcher, Purcell, Baker, & Munro, 2012; Yoshinaga-Itano & Sedey, 1998). However, some studies still suggest that despite early identification many children continue to receive intervention later than desired and thus there can still be lags in speech and language development (Ching et al., 2013). Overall speech and language abilities are also influenced by mode of communication (Geers et al., 2000) and is discussed below. With improved

communication abilities, children may bypass many of the SED problems reported in previous decades. However, it is not clearly understood if this is true. Therefore the present review will focus on studies that are limited to the past 15 years to address a more current representative population of children with hearing loss who have benefitted from early identification and intervention along with high-end technology.

Sensory Management

Sensory management refers to the type of device that children use to offset their hearing loss. Overall, children with state-of-the-art hearing aids or cochlear implants (CIs) both appear to function well with devices (Anmyr, Olsson, Larson, & Freijd, 2011), however there are noted differences. For example, in children with mild to moderate sensory losses who use current hearing aids (i.e. digital amplification), speech and language development can be near same age peers (Moeller, 2007). However, speech perception can be superior in children using cochlear implants compared to hearing aids in children with severe to profound losses (Lejeune & Demanez, 2006; Mildner, Sindija, & Zrinski, 2006). In a longitudinal study, Yoshinaga-Itano, Baca and Sedey (2010) reported that receptive language ability in children with severe to profound hearing loss using cochlear implants was similar compared to the normative data on hearing children and only 7 months delayed in expressive vocabulary. In fact, many children who receive cochlear implants are able to develop English language skills commensurate with their normal hearing peers (Svirsky, et al., 2000). Not all children achieve equivalent performance levels. In one longitudinal study, the spoken language abilities of 153 preschool children with CIs demonstrated that half of the children achieved scores in the average range while the other half did not (Geers & Nicholas, 2013). Thus, while most

implant users achieve tremendous outcomes, not all do, suggesting that other individual differences in other skills may also occur.

Communication Mode

Children with hearing impairment and their families typically receive a wide array of auditory habilitation interventions to develop communication skills negatively impacted by hearing loss. There are a variety of communication methods including listening and spoken language, cued language or cued speech, American Sign Language, or total communication that can be used with children with hearing loss. The communication mode selected is based upon the communication method that the parents choose to meet the needs of the child and their family. The extent of a child's hearing loss has been a primary factor used in parent decision making regarding choice of communication modality (Li, Bain, & Steinberg, 2003). Specifically, they found that parents of children with mild or moderate hearing loss often chose oral approaches (i.e. listening and spoken language) whereas with more severe losses, parents may opt for a manual form of communication. Other functional outcomes such as later socialization, academic achievement and self-esteem are also considered by parents when deciding on communication mode.

Listening and Spoken Language

One form of listening and spoken language (LSL) communication approach is called Auditory Verbal Therapy (AVT). It is widely considered as an oral mode of communication where children use auditory only stimulation to listen and verbal language to talk. Additionally LSL relies on consistent parental involvement throughout

the rehabilitative process (Lim & Simser, 2005; Yucel, Derim, & Celik, 2008). Given that over 90% of children with permanent hearing loss are from families where both parents are hearing (Mitchell, 2004), many families adopt a listening and spoken language form of communication soon after diagnosis (Eriks-Brophy, 2004). There are ten principles used by therapists implementing AVT, which are summarized in Appendix A. Multiple studies have suggested that AVT is an effective approach for the development of spoken language for children with hearing loss (Dornan, et al., 2007; Dornan, Hickson, Murdoch, & Houston, 2009; Dornan, Hickson, Murdoch, Houston, & Constantinescu, 2010; Fairgray, Purdy, & Smart, 2010), and particularly for those using cochlear implants (Sahli & Belgin, 2011). In some cases this approach allows children with hearing impairments to close the developmental and academic gap by obtaining levels of speech, language, and self-esteem equivalent to their typically hearing peers. However, there remains a need for additional types of research to support the use of LSL in relation to SED for young children. Additional evidence about communication approaches beyond speech and language outcomes alone could provide additional insight for parents trying to make decisions for a deaf or hard of hearing child. For further reading about AVT, the reader is referred to a Cochrane database systematic review (Brennan-Jones, White, Rush, & Law, 2014).

Relationship between hearing loss, language and social-emotional development

Research has shown that children with hearing loss, including those with mild or unilateral losses, may be at risk for encountering problems with social-emotional development (Dammeyer, 2010; Hogan, Shipley, Strazdins, Purcell, & Baker, 2011; Tharpe, 2008). Many have hypothesized that such delays are related to language abilities

which can lag behind their hearing peers. Given the improved outcomes in speech and language for children who use CIs, one could hypothesize that social emotional problems may not be observed in this population of children with hearing loss. However, since results vary among children with CIs, and given that language is a social tool that children use to communicate with peers, it is logical that a child facing difficulty developing oral language would also face difficulty in social settings or in a mainstream classroom where oral/verbal exchanges are the predominant mode of communication. While oral language ability has been identified as a predictor for the potential to make secure friends in the mainstream setting (Leigh & Power, 2004), even in children with profound hearing loss who have comparable language abilities to same age hearing peers, difficulties establishing friendships remain (Raver, Bobzien, Richels, Hester, & Anthony, 2014). Therefore, the tremendous improvements cited above related to speech and language do not automatically translate into successful peer interactions.

Most often, social-emotional development hinges on an individual's self-esteem, ability to form relationships with others and the ability to demonstrate empathy (Rivers, Tominey, O'Bryon, & Brackett, 2013). Given this definition, there are several dimensions that can be evaluated related to SED. While Erikson's model of social-emotional ability has withstood the test of time, a more current model is described by Denham and colleagues (2009), illustrated in Table 2.1. They describe several domains that can be measured which reflect SED such as 1) attachment; 2) emotional competence; 3) social competence; 4) self-perceived competence and 5) temperament/personality, as shown in Figure 2.1. For the purposes of this study, the first three dimensions of SED were

reviewed in relation to children with hearing loss. The authors reasoned that temperament and personality were innate individual variables rather than skills that could be taught.

Table 2.1 – Developmental Milestones in Social-Emotional Domain Dimensions

Developmental Period	Social Competence	Attachment	Emotional Competence	Self-perceived competence	Temperament/ Personality
Infancy (birth to 18 or 24 months)	Interest in people; shows desire for personal attention. Capable of coordinated interaction. Initiates contact with age mates.	Formation of attachment bond with adults. Inception of “internal working model” of attachment (ie, security or insecurity of attachment emerges.)	Expression of basic emotions. Differential reaction to adult emotions. Emotion regulation; some self-soothing, much assistance by adults.	Responds to own name; recognizes self. Expresses ownership or possession. (Note: these milestones are really more closely allied with self-concept than perceived competence)	Shows distinct dimensions of self-regulation and reactivity.
Toddler Period (18-24 months to 3 years)	Plays alongside age mates. Participates in group play.	“Goal-corrected partnership” in attachment (ie, the beginning of autonomy as well as connectedness.)	Expression of more social emotions (eg, guilt, shame, empathy.) Begins to comprehend “good” and “bad” feelings. More independent emotion regulation.	Speaks positively of self. Desires autonomy. Begins to have some idea of distinct domains of self-competence.	Moderate continuity seen in dimensions of temperament, but some change seen. Regulatory dimensions become more important due to anterior cortical brain development.
Preschool Period through Kindergarten (3 to 5-6 years)	Beginning peer interaction while managing emotional arousal. Beginning of specific friendships and peer status. Prosocial behaviors and interactions emerge.	Enjoys familiar adults. Separates easily from parents.	Expression of ‘blended’ emotions. Understands expressions and situations of basic emotions. More independent emotion regulation.	Shows awareness of differentiated physical, social and cognitive abilities. Speaks positively of self. Asserts self in socially acceptable ways.	Temperament beginning to be differentiated into personality.
Grade School	Formation of dyadic friendships. Solidification of peer status. General diminution of physical aggression.	Begins to balance connection to parents and peers.	Use of display rules. Understands complex emotions (eg, ambivalence, unique perspectives.) Begins independently to use cognitive strategies to regulate emotions.	Greater differentiation of self-perceptions of physical, social and cognitive abilities. Social comparison becomes even more important.	Personality traits becoming more differentiated.

Note. Adapted from “Assessing social-emotional development in children from a longitudinal perspective,” by S.S.Denham, T.M.Wyatt, H.H.Bassett, D.Echeverria, S.S.Knox. 2009, *J Epidemiol Community Health*, 63, p.37-52. Adapted with permission.

Figure 2.1 – Domains of Social-Emotional Development



Attachment

Attachment theory describes the effect of long term, close relationships that are established early in life (Bowlby, 1978). These bonds are critical to a child's ability to form similar connections later in life. The strength of an attachment is reflected by the expression of emotions by the parent or caregiver and the infant. It is also reflected by the sensitivity of each to the other's emotional reaction (Pipp-Siegel, et al., 2002). Given that healthy attachment has been shown to support language development (Dewolf, 1986) and language development can be delayed in persons with hearing loss as previously discussed, attachment would be a worthwhile domain of research. However, to date there is very little known about this area. Emotional availability is considered empirically linked with attachment (Biringen, 2000; Volling, McElwain, Notaro, & Herrera, 2002) because it reflects the quality of the parent-child interaction. Emotional availability was evaluated among a group of parents/caregivers of children with hearing loss (n=21) and compared to those with normal hearing (n= 21) (Pressman, Pipp-Siegel, Yoshinaga-Itano, Kubicek, & Emde, 1998). Interestingly, emotional availability was actually stronger between the dyads with children with hearing loss and their parents compared to those with normal hearing. This outcome is extremely encouraging yet needs further exploration.

Maternal sensitivity underlies attachment as described by Biringen (2000) and has been assessed in mothers of toddlers with mild to severe hearing loss. The mother's ability to sense and react to a child's cues, to settle conflicts and to preserve an upbeat manner in daily interactions was assessed in 24 dyads, 15 of whom had hearing loss. Overall maternal sensitivity was 6.55 (on a scale of 1= lowest to 9= highest), with higher

sensitivity predicting expressive language ability. In a recent state of the knowledge review about social-emotional abilities in children with hearing loss, Moeller, (2007) suggests that the establishment of strong nurturing emotional relationships particularly between the parent and child likely reduces the frustrations that can occur with when the utterances of a child with hearing loss are not understood. Furthermore, these attachments should be viewed as an important component that facilitates SED in children with hearing loss.

Emotional Competence

Emotional Competence can be broadly defined as an awareness of one's own emotions as well as others' emotions which extend along a vast continuum of sentiments (Denham, et al., 2009). Furthermore, children must have the ability to respond to such emotions and convey appropriate interpersonal emotional responses. While there is overlap between definitions of social competence (below) and emotional competence, some researchers have proposed that the capacity to understand the emotions of others and know how to respond appropriately actually supports social competence (Denham, et al., 2009). Such behaviors will often emerge during the preschool years as children begin to display a range of expressions. Most 2-year-olds will talk about their wants and feelings. Additionally, many toddlers have developed object permanence and know that their parents will return even when they leave. Toddlers gradually show less anxiety when parents leave and are often thrilled when they return. Three to four-year olds talk about thoughts and begin to engage in lies and trickery. Most are also adept at knowing how to get attention when needed. Amazingly, they can even be observed to fake injury

to get attention, which suggests that they understand of how to manipulate their own behavior to affect a desired outcome.

Theory of Mind (ToM) refers to an individual's ability to understand that others have different thoughts and feelings than their own and is dependent on a child's opportunity for social interaction with others. Furthermore children begin to attribute beliefs, intentions and memories to others and start to make predictions about the world around them. Their ability to determine what is real from unreal matures later in the preschool years of children with normal hearing (Moeller & Schick, 2006). Previous research in children with hearing loss and secondary language delays have demonstrated lags in development of ToM (Peterson & Siegal, 1995, 2002). However when using appropriate sensory management such as a cochlear implant (n=72) children mastered the early stages of ToM commensurate with their hearing peers (n=69) but lagged behind in the later stages of ToM where more advanced skills occur such as determining false beliefs from true beliefs (Ketelaar, Rieffe, Wiefferink, & Frijns, 2012). Acquiring skills related to ToM is likely learned incidentally from indirect hearing and observation of conversations among adults and older children as described by Cole and Flexer (2007). Considering that incidental learning opportunity would naturally vary tremendously from child to child, the development of ToM would seem to be at risk in children with hearing loss.

Social Competence

Social Competence can be defined as the “effectiveness in developmentally appropriate social interactions” (Denham, et al., 2009). During preschool age, parent

interactions remain important while the number and value of peers gradually increases. As such, their ability to engage successfully in pro-social interactions will require them to display adequate emotional regulation. Therefore peer interaction is critical to children being able to later demonstrate adequate social adjustment (Bierman, 2004). A precursor to developing social competence among deaf and hard of hearing children is to access and participate with peers. Some studies have examined play behaviors in preschool age children between same age and normal hearing and deaf peers (Lederberg, Rosenblatt, Vandell, & Chapin, 1987). During free play, they documented the duration of child interactions, the number of interactions and the complexity of interactions among deaf and hearing 4-year olds. After reviewing multiple 5 minute sessions of almost 60 children, they concluded that both hearing and deaf/hard of hearing children interacted more frequently with children with similar hearing abilities. In fact, both groups of children demonstrated a bias to individuals with similar hearing abilities. DeLuzio and Girolametto (2011) reported similar results when evaluating the types of initiations and responses during play between children with normal hearing compared to severe to profound loss. While they found no significant difference between groups in terms of their initiation efforts, normal hearing children responded to deaf/hard of hearing peers less often and actually excluded them from participating during play. This finding suggests that even in preschool settings there is an opportunity to improve the foundations of peer acceptance among this population.

Wiefferink, Rieffe, Ketelaar, and Frijns (2012) evaluated children ages 1.5 to 5 with cochlear implants in regard to emotion-regulation and social competence. The children in their study presented with fewer adequate emotion-regulation strategies and

less social competence than normal hearing children. Given that the children in the study received early intervention services suggests that even with optimal services and technology for treatment of hearing loss, there is still a possibility of a delay in such skills. While there is a very good possibility that they may catch up with their hearing peers, this should be an important dimension to monitor to insure that this does in fact happen.

Research Questions

The primary purpose of this study was to describe social-emotional ability in children (ages 3.0-6.6 years) with sensorineural hearing loss who used either hearing aids or cochlear implants and LSL communication. Specifically, SED was described based on parent reports. Several domains of SED were examined including play competence (play disruption, interaction and disconnection), social competence, adaptation, and risk for developing behavioral or emotional problems. The secondary purpose was to examine each child's social-emotional abilities within the context of other demographic factors such as degree of hearing loss, age of identification and language ability. Finally, parent reports of SED were compared to childcare provider reports for a subset of participants to explore the pattern of responses between them.

Chapter 3

Methods

Participants

A total of five parent-child dyads consented to participate in this study, which was approved by the University of Kentucky Institutional Review Board. Participants were recruited through sharing an advertising flier with potential participants through a local hearing and speech center. Parents interested in participating contacted the student investigator and were invited to complete the interview. Therefore, the parents and their child with hearing loss represent a convenience sample of participants who have received services or continue to receive services through the local hearing and speech center.

All dyads consisted of a one parent and one child aged 3:0 to 6:6 years with permanent sensorineural hearing loss who used either hearing aids or cochlear implants for sensory management. The child participants were receiving or had already received Auditory Verbal Therapy at the time of the study, and used LSL for their primary mode of communication. Of the five child participants, two were female and three were male. A summary of demographic variables for each child participant is shown in Table 3.1. Each child was given a pseudo-name to protect their identity. Of the five parent participants, four were female and one was male. Additionally, demographic data regarding the highest level of education obtained was collected from parent participants. Three parent participants had obtained Bachelor's degrees, one a Master's degree, and one obtained a high school diploma. All parent participants were hearing and communicated orally.

Additionally, data was obtained from two childcare provider participants who chose to take part in the study. The parent participants identified the childcare providers who provided after-school care for their child. No demographic data was obtained for the caregiver participants.

Table 3.1 – Demographic Data of Child Participants

	Harrison	Kay	Amy	Cade	Adam
Degree of HL Right Ear	Profound SNHL	Rising Profound to Severe	Severe SNHL	Sloping: Mild to Moderate SNHL	WNL
Degree of HL Left Ear	Profound SNHL	Profound SNHL	Severe SNHL	Sloping: Moderate to Severe SNHL	Profound SNHL
Device at Right Ear	CI	CI	HA	HA	N/A
Device at Left Ear	CI	CI	HA	HA	HA
Etiology	Connexin 26	Unknown	Genetic	Unknown, Congenital	Unknown, Nongenetic
Age of ID (months)	0	24	23	1	0
Age Child Began Speech/Language Intervention (months)	1.5	30	18	6	5
Age at time of study (years:months)	6:5	3:7	4:1	5:2	5:9
Enrollment Status in AVT program	Graduate	Enrolled at time of study	Enrolled at time of study	Graduate	Graduate

Measures

Three standardized, norm-referenced outcome measures were selected to determine the social-emotional function of each child participant. Assessments were chosen based on criteria including standardization, availability of normative data, and relevancy of skills assessed to social-emotional development. Outcome measures utilized in this study were the Penn Interactive Play Scale (*PIPPS*) (McWayne, Sekino, Hampton, & Fantuzzo, 2007), the Social Competence and Behavior Evaluation – Preschool Edition (*SCBE*) (LaFreniere & Dumas, 1995), and the Behavior Assessment System for Children – Second Edition (*BASC-2*) (Kamphaus & Reynolds, 2007). The *PIPPS* represents a measure of social competence, whereas overall the *SCBE* reflects both social competence and emotional competence by subdomains and the *BASC-2* assigns a risk classification level for social-emotional problems based upon both social and emotional competence.

The *PIPPS* is a behavioral rating instrument designed to be used for research purposes and developed for use with teachers, parents, and primary caregivers of children in preschool and kindergarten. Normative data for the *PIPPS* was based on a sample from a large, urban school district with a high percentage of low-income and minority children. Parallel versions of the parent and teacher rating scales both consist of 32 four-point Likert-scale items. These items indicate how often in the previous two months the caregiver has observed the stated behavior during peer play. The items are rated as occurring “never,” “seldom,” “often,” or “always.” Items included on the *PIPPS* assess both competencies and needs within play to identify students who demonstrate successful peer relationships and those who have difficulties with peers. There are three dimensions of the *PIPPS*, consisting of Play Interaction, Play Disruption, and Play Disconnection.

Play Interaction represents children's play strengths and behaviors such as comforting and helping other children, demonstrating creativity in play, and inviting others to join in play. Play Disruption indicates aggressive or antisocial behaviors that interfere with peer play interactions. Play Disconnection describes withdrawn behavior or nonparticipation in peer play.

The *SCBE* is an observation and rating scale used to describe the child's behavior for purposes of socialization and education. Normative data for the *SCBE* was based on more than 1,200 preschool children in the United States. The *SCBE* focuses on the child's ability to adapt and function within his or her environment. The evaluation consists of 80 items that comprise eight basic and four summary scales. For the purpose of this study, only the four summary scale scores were calculated, as the eight basic scales are combined to obtain the four summary scales and are therefore inherently represented. The four summary scales consist of Social Competence, Externalizing Problems, Internalizing Problems, and General Adaptation. The Social Competence scale is comprised of 40 items reflecting the positive qualities of a child's adaptation. The Internalizing Problems scale summarizes the child's emotional difficulties, whereas the Externalizing Problems scale summarizes the child's behavioral difficulties. The General Adaptation scale represents a global summary score and an overall index of the child's adaptation.

The *BASC-2* is a comprehensive set of rating scales designed to measure adaptive and problem behaviors in children. Normative data from the *BASC-2* was based on current United States Census population characteristics. Both parent and teacher forms describe specific behaviors that are rated on a four-point scale of frequency as occurring "never," "sometimes," "often," or "almost always." The total score obtained on the

BASC-2 is considered to be a reliable and accurate predictor of a broad range of behavioral and emotional problems. A classification level of Normal, Elevated, or Extremely Elevated is assigned based on the total score, denoting the amount of risk a child has of developing a behavioral or emotional problem.

Procedures

Parent participants met with the researcher for one-on-one interviews in a private office at the hearing and speech center. During the interview, parents completed a questionnaire, which provided the demographic information provided in Table 2. Parents also completed the assessment measures described above in a verbal interview format. Before each assessment was completed, parents were provided a brief overview describing the measure, how they would be asked to answer the questions, and the purpose of the assessment measure. All assessments were administered in the same order and all directions for assessments were provided through scripts, as shown in Appendix B. The examiner answered any questions that arose throughout completion of the measures. Following completion of the interview, parents were thanked for their participation, given an opportunity to ask questions, and provided with contact information of the researcher for any future questions. The average time required for parent participants to complete all measures was 60 minutes.

Packets containing a cover letter, instructions, outcome measures, and a preaddressed postage-paid envelope were provided for childcare provider participants. Childcare providers completed teacher versions of the *PIPPS*, *SCBE*, and *BASC-2*. Completed forms were returned to the researcher by mail.

Following parent interviews, the primary investigator completed retrospective chart reviews of the children's records at the local hearing and speech center. Standard scores were obtained from the most recent yearly assessment found in each child's records to investigate each child's expressive and receptive language and articulation skills. For each child the most recent scores for the Expressive Vocabulary Test (*EVT-2*) (Williams, 2007), Peabody Picture Vocabulary Test (*PPVT-4*) (Dunn & Dunn, 2007), and Goldman-Fristoe Test of Articulation – Second Edition (*GFTA-2*) (Goldman & Fristoe, 2000) were recorded. The *EVT-2* is a standardized, norm-referenced assessment of expressive vocabulary and word retrieval, with scores representing the expressive language functioning of the students. The *PPVT-4T* scores were obtained to represent the receptive language functioning of the student participants. The *PPVT-4T* is a standardized, norm-referenced assessment of receptive vocabulary. The *GFTA-2* is a norm-referenced, standardized assessment of articulation or speech sound production. Scores on the *GFTA-2* represent students' abilities to produce consonant sounds in words. Data was collected on these measures to represent the speech and language functioning of the child participants at the time of the study. As mentioned in Chapter 1, problems with SED may be linked to communication challenges and potential language delays which often occur in children with hearing loss (Eisenberg, 2007); therefore it was necessary to determine each child's speech and language ability to account for all factors influencing his or her individual development. The *PPVT* and *EVT* scores representing receptive and expressive vocabulary and word retrieval were used as a representation of each child's language ability, as these were the only standardized measures of language available through the

yearly assessments completed for each child. No other formal language assessment scores were available to the researcher at the time of the study.

Data Analysis

Demographic data was organized in an Excel spreadsheet. Means and standard deviations were determined for *PIPPS*, *SCBE*, and *BASC-2* scores. All tests were scored independently by two graduate students in speech language pathology. Inter-rater scoring for all assessments and subtests was determined by summing the total number of tests scores upon which both raters achieved the same score and dividing it by the total number of possible tests. This was then converted to a percentage indicating inter rater scoring agreement. The inter-rater scoring agreement obtained was 100%. Results were compiled into a table labeled with standard scores and percentile ranks and cases were inspected for patterns.

Chapter 4

Results

Results are presented individually for each child participant. Specific scores for each child participant denoting standard scores, t-scores, standard deviation, percentile rank, and description of score (below average, average, or above average) are shown in Tables 4.1 – 4.5. For the subset of participants with information from childcare provider report an additional table is included denoting the additional scores.

Harrison (6:5)

Harrison was a six year, five month old male with bilateral profound sensorineural hearing loss as shown in Table 3.1. Specific scores for Harrison are shown in Table 4.1. Harrison obtained standard scores within the average range on the *EVT-2*, *PPVT-4*, and *GFTA-2*, indicating that his speech and language skills assessed by these measures were within normal limits. His scores on the Play Interaction and Play Disruption dimensions on the *PIPPS* indicated that he demonstrated behaviors within the average range for those dimensions. Harrison's score on the Play Disconnection dimension indicated that he exhibited a higher level of the play dimension than other children. His scores on the *SCBE* indicated that he demonstrated adjustment within the average range for a child his age. Based on the score he received on the *BASC-2*, Harrison was classified as having a "normal risk" for the development of behavioral or emotional problems.

Table 4.1 – Harrison – 6:5

Harrison	Below Average				Average								Above Average		
Standard Deviation = SD	-3		-2		-1				+1		+2				
Standard Score = SS	55		70		85		100		115		130				
t scores = t	</=30		37		43		50		57		>/=70				
Percentile Rank	1	2	5	9	16	25	37	50	63	75	84	91	95	98	
Language:															
Expressive (EVT-2)							94 SS								
Receptive (PPVT)					85 SS										
Speech:															
Articulation (GFTA-2)					85 SS										
Psychosocial															
PIPPS															
Interaction							46 t								
Disruption											58 t				
Disconnection											61 t				
SCBE															
Adaptation									51 t						
Social Competence									52 t						
Internalizing									55t						
Externalizing							43 t								
BASC							44 t								

Kay (3:7)

Kay was a three year, seven month old female with bilateral sensorineural hearing loss, profound in the left ear and rising profound to severe in the right ear as shown in Table 3.1. Specific scores for Kay are shown in Table 3b. Kay's scores on the expressive and receptive language measures were greater than three standard deviations below the mean, indicating that she had significantly delayed language levels in regard to receptive and expressive vocabulary and word retrieval. It was not possible to assess Kay's articulation skills secondary to her limited language ability. Kay's scores on the *PIPPS* dimensions indicated that her peer play behaviors fell with the average range. Her scores on the subscales of the *SCBE* were considered to demonstrate average adjustment of a child her age. Kay's total score on the *BASC-2* classified her being of "normal risk" for the development of behavioral and emotional difficulties.

Table 4.2 – Kay – 3:7

Key	Below Average				Average								Above Average		
	-3		-2		-1				+1		+2				
Standard Deviation = SD	55		70		85		100		115		130				
Standard Score = SS	<=30		37		43		50		57		>=70				
t scores = t	1	2	5	9	16	25	37	50	63	75	84	91	95	98	
Percentile Rank															
Language:															
Expressive (EVT-2)	43 SS														
Receptive (PPVT)	36 SS														
Speech:															
Articulation (GFTA-2)															
Psychosocial Parent															
PIPPS															
Interaction								46 t							
Disruption								46 t							
Disconnection								47 t							
SCBE															
Adaptation								50 t							
Social Competence								50 t							
Internalizing								50 t							
Externalizing								48 t							
BASC								46 t							

Psychosocial Caregiver														
PIPPS														
Interaction									52 t					
Disruption								46 t						
Disconnection							43 t							
SCBE														
Adaptation									54 t					
Social Competence									55 t					
Internalizing								47 t						
Externalizing									54 t					
BASC							43 t							

Amy (4:1)

Amy was a 4:1 year old female with bilateral severe sensorineural hearing loss as shown in Table 3.1. Specific scores for Amy are shown in Table 4.3. Amy obtained standard scores within the average range on the *EVT-2*, *PPVT-4*, and *GFTA-2* indicating that her language and articulation abilities were within normal limits for the skills assessed on these measures. Amy's score on the Play Interaction dimension of the *PIPPS* indicated that she demonstrate a lower level of the play dimension than most children, while her score on the Play Disruption dimension indicated that she demonstrated a higher level than most children. Her score for the Play Disconnection dimension of the *PIPPS* fell within the average range. Amy's scores on the *SCBE* summary scales indicated that she demonstrated problematic adjustment across all four summary scales. Based on Amy's total score obtained on the *BASC-2*, she was considered to be in the "extremely elevated risk" level for the development of a behavioral or emotional problem.

Table 4.3 – Amy – 4:1

Amy	Below Average				Average								Above Average		
Standard Deviation = SD	-3		-2		-1						+1		+2		
Standard Score = SS	55		70		85		100		115		130				
t scores = t	<=30			37		43		50		57		63		>=70	
Percentile Rank	1	2	5	9	16	25	37	50	63	75	84	91	95	98	
Language:															
Expressive (EVT-2)									101 SS						
Receptive (PPVT)												114 SS			
Speech:															
Articulation (GFTA-2)						86 SS									
Psychosocial Parent															
PIPPS															
Interaction			29 t												
Disruption												63 t			
Disconnection											59 t				
SCBE															
Adaptation			32 t												
Social Competence			36 t												
Internalizing			34 t												
Externalizing			36 t												
BASC														73 t	

Psychosocial Caregiver														
PIPPS														
Interaction													64 t	
Disruption								50 t						
Disconnection					38 t									
SCBE														
Adaptation											59 t			
Social Competence											58 t			
Internalizing											58 t			
Externalizing									53 t					
BASC							47 t							

Cade (5:2)

Cade was a five year, two month old male with bilateral sensorineural hearing loss, sloping from moderate to severe in the left ear and mild to moderate in the right ear as shown in Table 3.1. Specific scores for Cade are shown in Table 4.4. Cade obtained standard scores within the average range on the *EVT-2*, *PPVT-4*, and *GFTA-2* assessments, indicating his speech and language functioning was within normal limits for the skills assessed on these measures. Cade's scores on the Play Interaction and Play Disconnection dimensions of the *PIPPS* fell within the average range, indicating that he demonstrated peer play behaviors commensurate with peers on those dimensions. His score on the dimension of Play Disruption indicated that he demonstrated a lower level of that play behavior than most children. Cade's scores on the *SCBE* indicated that he demonstrated adjustment within the average range for a child his age. Based on the score he received on the *BASC-2*, he was classified as facing a "normal risk" for the development of behavioral or emotional problems.

Table 4.4 – Cade – 5:2

Cade	Below Average				Average								Above Average					
Standard Deviation = SD	-3		-2		-1				+1				+2					
Standard Score = SS	55		70		85				100				115			130		
t scores = t	</=30		37		43		50		57		63			>/=70				
Percentile Rank	1	2	5	9	16	25	37	50	63	75	84	91	95	98				
Language:																		
Expressive (EVT-2)																		
Receptive (PPVT)																		
Speech:																		
Articulation (GFTA-2)																		
Psychosocial																		
PIPPS																		
Interaction																		
Disruption																		
Disconnection																		
SCBE																		
Adaptation																		
Social Competence																		
Internalizing																		
Externalizing																		
BASC																		

Adam (5:9)

Adam was a five year, nine month old male with unilateral profound sensorineural hearing loss as shown in Table 3.1. Specific scores for Adam are shown in Table 4.5. Adam's standard scores on the *EVT-2*, *PPVT-4*, and *GFTA-2* fell within the average range, which indicated his speech and language functioning was within normal limits for the skills assessed on these measures. His scores on the *PIPPS* dimensions indicated that his peer play behaviors fell with the average range. Adam's scores on the subscales of the *SCBE* were considered to demonstrate adjustment commensurate with his peers. Adam's total score on the *BASC-2* classified him as having a "normal risk" for the development of behavioral and emotional difficulties.

Table 4.5 – Adam – 5:9

Adam	Below Average				Average								Above Average		
Standard Deviation = SD	-3		-2		-1				+1		+2				
Standard Score = SS	55		70		85		100		115		130				
t scores = t	</=30		37		43		50		57		>/=70				
Percentile Rank	1	2	5	9	16	25	37	50	63	75	84	91	95	98	
Language:															
Expressive (EVT-2)										108 SS					
Receptive (PPVT)											116 SS				
Speech:															
Articulation (GFTA-2)										109 SS					
Psychosocial															
PIPPS															
Interaction							46 t								
Disruption									55 t						
Disconnection									55 t						
SCBE															
Adaptation									53 t						
Social Competence										57 t					
Internalizing									54 t						
Externalizing						41 t									
BASC									50 t						

Chapter 5

Discussion and Conclusion

The primary purpose of this study was to describe social-emotional ability in children (3.0-6.6 years of age) with sensorineural hearing loss who had either amplification or cochlear implant and used LSL as a primary communication mode. Overall, social-emotional development within this population appears to be occurring in a similar manner to normative data obtained on children with normal hearing on all three metrics of SED. Only one child was identified as at-risk for developing social-emotional problems. This finding is consistent with previous reports, which suggested an average of 20% of children with hearing loss may face SED challenges (Hintermair, 2007; Van Eldik, Treffers, Veerman, & Verhulst, 2004). While there is some debate as to the prevalence of problems with SED in children with typical hearing, most research suggests that the rate is lower than that for children with hearing impairment, ranging from 9.5 – 14.2% in children ages 0-5 (Brauner & Stephens, 2006). Therefore, despite relatively early intervention, appropriate use of devices, and implementation of LSL, there remains a possible risk for SED issues at young age in some children with permanent sensorineural hearing loss. As such, SED would appear to be an additional area that should be assessed in children with hearing loss during their early intervention years. Furthermore, monitoring of how social-emotional skills develop in children with hearing loss throughout their school age years would also seem valuable so that parents and teachers are aware of this area of development and intervene effectively if necessary. Evaluating SED in children who are transitioning from one school to another would seem

to be a logical time, given the likely changes that will occur relating to instructor, environment, routines, and peers.

Given that some children with an identified hearing loss may be at-risk for social-emotional problems, and social-emotional issues are evidently linked to academic success (Raver, 2002; Hampton & Fantuzzo, 2003), it would seem reasonable for clinicians to use a client-centered approach and evaluate children with hearing loss across multiple developmental domains to determine strengths and weaknesses beyond speech and language abilities. In fact, some researchers now suggest that all early childhood assessments include measures designed to monitor SED, especially in light of the fact that early intervention targeting social-emotional skills aids in prevention of more serious problems in the future (McCabe & Altamura, 2011). Providing screenings or assessment of SED at a young age may help identify children at risk and allow for planning of services to address these skills. Furthermore, parents value coordinated service efforts that include multiple areas (Fitzpatrick, Angus, Durieux-Smith, Graham, & Coyle, 2008). While early intervention providers work closely with children and their families during this time they do not typically continue to follow the child. Additionally, multiple studies have discussed challenges faced by primary care pediatricians in identification of children experiencing problems with SED (Alexander, Brijnath, & Mazza, 2013; Tanner, Stein, Olson, Frintner, & Radecki, 2009). Therefore, professionals providing services to children at an early age, such as speech-language pathologists, should be aware of SED milestones to aid in identifying children at-risk to help prevent potential problems and make appropriate referrals. Educating parents about SED milestones and expectations even during the preschool years would be prudent to help prepare families to recognize

and address possible challenges. It is best practice to fully inform parents, and with more information families would be better prepared to handle issues later. Despite the small size of the present study, one of the 5 children (Amy) faced an elevated risk of developing social-emotional problems.

The secondary purpose of this study was to examine each child's social-emotional abilities within the context of other demographic factors such as degree of hearing loss, age of identification and language ability. Lastly, we sought to compare parent and caregiver reports of social-emotional ability. The discussion below is organized by grouping the five children according to their overall risk of developing SED problems. Therefore, Amy is discussed first by herself, followed by Harrison and Kay, and then by Cade and Adam.

Amy (4.1 years of age) obtained excellent scores on speech and language assessments, despite her severe hearing loss and being identified at the age of 22 months, which is 16 months after the desired time of identification as described by the Joint Commission on Infant Hearing (JCIH, 2007). However, based on the results of the psychosocial measures completed by her parent, she faces a great risk for developing problems. Amy was the only child in the study identified as have problems with SED. At present time, she attends preschool in a small, structured environment with hearing impaired peers. These issues may become more problematic as she ages and enters a mainstream school setting. Additionally, these results are concerning due to the link between academic failure and problems with SED (Hampton & Fantuzzo, 2003; Raver, et al., 2014). Amy's mother indicated that Amy is "head strong and opinionated." While this type of temperament may be associated with Amy's risk of SED issues, it may or

may not be causing it (Denham, et al., 2009). The later age of identification could partially explain Amy's potential risk in light of the fact that for these past two years the family's efforts have been to improve speech and language. Therefore Amy has had very little opportunity to interact with others beyond the small classroom setting. Amy's parents should be informed about SED and how to obtain resources, and the development of her social emotional skills should continue to be monitored. Additionally, careful planning should occur when she transitions to a mainstream setting.

Interestingly, the results obtained from Amy's childcare provider report were inconsistent with the results from parent report. Based on the results of social-emotional measures, Amy's childcare provider reported that her social-emotional abilities fall within the average range. This suggests that Amy's parents see problems that the childcare provider does not. This may be partially explained by the fact that behaviors observed during parental interactions and childcare provider interactions vary. For example, Amy's mother reported that Amy seldom directs others' action politely and often disrupts the play of others, whereas the childcare provider reported that Amy often directs others' action politely and never disrupts the play of others. Overall, parents and childcare providers tend to have similar preferences in what behaviors they value and what they dislike; however, the two groups may view children differently in regard to the behaviors, and therefore not identify behaviors as occurring with the same frequency (Feagans & Manlove, 1994). Furthermore, these researchers found that parents chose emotional characteristics, such as "cheerfulness" or "warm and affectionate," more frequently as desirable characteristics whereas childcare providers were more likely to choose social characteristics, for example "gets along easily with others" or "liked by

other children.” There are also differences in the microsystems of the environmental settings where children are observed (i.e. day care vs. home), which may influence a child’s behavior. For example, parents spend about twice as much time with their child than day care providers; therefore a day care provider would have less opportunity to observe a child’s behaviors in comparison to a parent. Furthermore, parents at home are often presented with multiple competing needs in the home and may view the child’s behavior in the context of other responsibilities, in contrast to a day care provider.

Due to potential language problems, Harrison (6.5 years of age) and Kay (3.7 years of age) may face a slight risk for problems with SED. Harrison’s profound hearing loss was identified at birth. Currently he appears to be developing well in regard to speech, language, and social-emotional skills. However, his speech and language scores fall at 1 standard deviation below the mean. While he is not at risk at this time, his family should be informed regarding SED. Harrison should continue to be monitored to ensure that his skills continue to progress and he does not fall behind his peers. Due to the fact that he already attends kindergarten in a mainstream class and seems to be managing well, this may or may not be a problem in the future. Kay’s low speech and language scores could be attributed to late identification of her profound/severe hearing loss, at the age of 26 months. At this time, her scores on social-emotional measures fall within the average range. Results obtained from Kay’s childcare provider report were consistent with the parent report. Information provided in both reports suggests that her social-emotional skills are acceptable at this time. However, her low level of language ability places her at risk for future problems. Additionally, at this time Kay is still very young and attends preschool in a small, structured setting with hearing impaired peers. As she

ages and enters mainstream settings problems with SED may become more evident. Like Harrison, her family should be informed about SED and her development should continue to be monitored.

Cade (5.2 years of age) and Adam (5.9 years of age) had the least amount of hearing impairment of all participants. Cade was identified as having a sloping hearing loss early, at the age of 1 month. His speech and language scores at this time indicate that his abilities fall well within normal limits. Given his less severe hearing loss, early identification, and current level of social-emotional skill, he would appear to have little risk of developing social-emotional problems. Adam's unilateral profound hearing loss was identified at birth. He obtained speech and language scores within the average range. At this time he appears to exhibit average social-emotional skills; however, based on his diagnosis of unilateral hearing loss he may still be at risk for academic and behavioral problems (McKay, 2006). Again, parents should be educated about the importance of SED, its relationship with overall academic ability and the overall anticipated milestones or stages of SED. This way parents become aware and could be better prepared to respond should SED issues arise. For example, Tharpe (2008) suggested that the impact of hearing loss may be underestimated for children with unilateral or mild to minimal loss, in comparison to severe to profound hearing loss. Although the assumption may be that children with less severe hearing loss face few problems, in reality they remain at-risk for academic and social-emotional problems. For example, in a group of children with unilateral hearing loss only half were performing satisfactorily in school (Bess & Tharpe, 1988). Additionally, 20% of the same group of children were identified by their teachers as exhibiting problem behaviors, despite receiving preferential seating in the

classroom. Furthermore, children with this type of hearing loss have also been described as exhibiting uncooperative and inattentive behaviors in educational settings, with excessive behavior problems reported including social withdrawal and aggression, even when performing adequately academically. Given these reported difficulties, families of children with even unilateral or mild to minimal hearing loss should be informed regarding SED and potential future problems.

SED is reflected by a set of behaviors that encompass a variety of skills as discussed throughout this paper. As such, social-emotional skills can be learned similarly to academic skills (Greenberg et al., 2003) by explicitly targeting and teaching the skills. Research examining interventions for SED in preschool children shows that for children at-risk for developing social-emotional problems, intervention for language and literacy skills alone without addressing SED does not predict improvements in behavior when the child enters kindergarten (Nix, Bierman, Domitrovich, & Gill, 2013). Furthermore, positive social interaction behaviors in kindergarten were distinctively connected to improvements in positive social interactions in preschool. The gains in social-emotional skills during preschool were also found to uniquely predict academic skills such as reading achievement and learning engagement in kindergarten, even after accounting for parallel preschool gains in academic abilities (Nix, Bierman, Domitrovich, & Gill, 2013).

Limitations

Although appropriate for a pilot study, the small sample size of this study was a limitation to generate any strong conclusions or generalization of results. Additionally, the participants in the sample were somewhat homogenous due to the fact that a

convenience sample was used consisting of families that all received LSL services at the local hearing and speech center. As there are only three speech-language pathologists certified to provide LSL services in the state of Kentucky, two of whom practice at the local hearing and speech center, there was limited availability to expand the sample.

Furthermore, there are some limitations in the interview-style format of the study. The interviews were not recorded, which may have provided anecdotal information in addition to the data obtained through the outcome measures. Although it is common practice to use parent report to gain information regarding children, gaining additional information through direct observation of the children would have been beneficial. However, due to healthcare privacy, consent policies, and potential disruption from an unfamiliar observer entering the classroom, it was impractical to access the multiple classrooms and after school care centers in order to directly observe the social-emotional skills of the children.

Due to the fact that only two childcare provider participants took part in the study, it was not possible to gain the full complement of childcare provider report in comparison to parent report. For the two childcare provider reports obtained, one was in agreement with parent report while the other was not. Therefore no patterns can truly be observed. It would be beneficial to have a greater number of childcare provider reports in order to inspect for patterns in SED as reported by different adults observing the children. Furthermore, input was not obtained from the children's teachers, which would provide a broader perspective of each child's SED in comparison to childcare provider report. The primary reason this was not attempted was because the child participants are currently enrolled in multiple different settings and access to teachers was limited.

Future Directions

It is not clear how regularly clinicians such as speech-language pathologists actually assess SED. Given that there is not widespread documentation about SED in children with hearing loss as described in the review of the literature, it would seem important to identify their awareness and knowledge about SED and to determine if they actually assess SED. Effective interventions that address how to teach social emotional skills in deaf and hard of hearing also need to be evaluated.

In conclusion, it is unclear if the findings observed here are affected by the LSL communication approach used or attributable to the more technologically sophisticated devices used or affected by a combination of the LSL approach, early identification and device use. However, what is clear is that SED problems may still occur in some children with hearing loss despite the advantages of enhanced language, mainstreaming and early intervention (Eriks-Brophy et al., 2006) in comparison to previous cohorts (Meadow & Dyssegaard, 1983). Additional effort to increase awareness about SED in children with hearing loss is clearly needed.

Appendix A

Principles of LSLS Auditory-Verbal Therapy (AG Bell Academy for Listening and Spoken Language)

1. Promote early diagnosis of hearing loss in newborns, infants, toddlers, and young children, followed by immediate audiologic management and Auditory-Verbal therapy.
2. Recommend immediate assessment and use of appropriate, state-of-the-art hearing technology to obtain maximum benefits of auditory stimulation.
3. Guide and coach parents to help their child use hearing as the primary sensory modality in developing listening and spoken language.
4. Guide and coach parents to become the primary facilitators of their child's listening and spoken language development through active consistent participation in individualized Auditory-Verbal therapy.
5. Guide and coach parents to create environments that support listening for the acquisition of spoken language throughout the child's daily activities.
6. Guide and coach parents to help their child integrate listening and spoken language into all aspects of the child's life.
7. Guide and coach parents to use natural developmental patterns of audition, speech, language, cognition, and communication.
8. Guide and coach parents to help their child self-monitor spoken language through listening.

9. Administer ongoing formal and informal diagnostic assessments to develop individualized Auditory-Verbal treatment plans, to monitor progress and to evaluate the effectiveness of the plans for the child and family.
 10. Promote education in regular schools with peers who have typical hearing and with appropriate services from early childhood onwards.
- *An Auditory-Verbal Practice requires all 10 principles.

Appendix B

Script for Parent Participants

I. Introduction: Candidacy and Inclusion/Exclusion Criteria

Thank you for your interest in this study. You have been asked to take part in this study because you are the parent of a child enrolled in, or a graduate of, Auditory Verbal Therapy. By doing this study, we hope to learn about the social-emotional ability of young children who are Deaf and Hard of Hearing and use Auditory Verbal Therapy. You should not take part in this study if you do not have a child between the ages of 3-6 currently enrolled in, or a graduate of, Auditory Verbal Therapy, or if your child has an impairment affecting development other than speech or hearing.

II. Informed Consent

If you would like to participate in this study we will now complete the consent process. Please read this information about the study and ask any questions. At this time I would also like to ask your permission so that I may complete a chart review of your child's information in the records at Lexington Hearing and Speech Center. This form explains what information we will be obtaining through the study and how the information will be used. If you would still like to participate in the study after you have read the consent form and protect health information form, please sign and date the last page of each form.

Please ask me any questions that you have throughout the time we are here. If you have any additional questions at a later time you may email or call me. If at any time you decided to not participate in the study, please let me know and you will be free to go.

III. Background Questionnaire

I would like for you to complete this questionnaire regarding your child's hearing impairment, intervention history, and social history. Please answer all questions to the best of your ability. If at any time you have questions or would like clarification, please ask. Do not write your name or your child's name on the form. Instead, all of the forms we are using have been labeled with a randomly assigned participant number. This is necessary to protect you and your child's privacy.

On the last page of the questionnaire you will see a table that says "completed by researcher only." This is where I will record the information I will obtain from the chart review of records at the Lexington Hearing and Speech Center. After you have completed the questionnaire we will move on to the other forms.

IV. Penn Interactive Peer Play Scale (PIPPS)

I would now like for you to complete an evaluation called the Penn Interactive Peer Play Scale, or PIPPS. The purpose of this evaluation is to see what types of behaviors your child uses during peer play. For each item, please rate how often you observe your child demonstrate the behavior described. You will rate the behavior as occurring never, seldom, often, or always.

Please keep in mind that these are general questions regarding behavior and social-emotional ability and may not apply to your child. When you have finished completing the PIPPS we will move on to the next form. Please let me know if you have any questions.

V. Social Competence Behavior Evaluation – Preschool Edition (SCBE)

I would now like for you to complete another evaluation that will describe your child's social-emotional ability. This evaluation is different from the one you just completed. It is called to Social Competence Behavior Evaluation, or SCBE. This evaluation is used to look at a child's behavior for the purpose of socialization and education and focuses on the ability of children to adapt and function in their environment. For each item, please rate how often you have observed you child demonstrate the behavior or emotional state. You will rate the items as occurring never, sometimes, often, or always.

Please keep in mind that these are general questions regarding behavior and social-emotional ability and may not apply to your child. When you have finished the SCBE we will move on to the next form. Please let me know if you have any questions.

VI. Behavior Assessment System for Children – Second Edition (BASC-2)

I would now like for you to complete another evaluation that will further describe your child's behavior. This evaluation is called the Behavior Assessment System for Children, or BASC-2. This evaluation looks at the ways children adapt their behavior in different situations and the frequency of these behaviors. For each item, please rate how often you have observed your child demonstrate the behavior. You will rate the item as

occurring never, sometimes, often, or almost always. Please keep in mind that these are general questions regarding behavior and may not apply to your child. Please let me know if you have any questions.

VII. Closing

Thank you for choosing to participate in this study. I would be happy to answer any questions you may have at this time. If you have questions later, please feel free to email me or call me using the email address and phone number included in your copy of the consent form.

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