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TRAINING CAREGIVERS OF YOUNG CHILDREN WHO ARE DEAF/HARD OF HEARING TO IMPLEMENT COMMUNICATION FACILITATION STRATEGIES

RACHEL LYNN WELLS

162 Pages

Caregiver-implemented communication intervention can result in increased communication skills in young children. Parents/caregivers are the first teachers of their children and are in natural positions to provide naturalistic communication intervention throughout their child's daily life within their home. Professionals who work with young children with communication delays can coach parents in strategies to help facilitate increased communication skills in their children and help incorporate therapeutic techniques into the family's regular routines. The current study examined the impact of training and coaching on caregivers' implementation of naturalistic language facilitation strategies with their children who are deaf or hard of hearing using a single case experimental multiple probe design. Two caregivers and their children who are hard of hearing participated in this study. The caregivers each received a training session and one caregiver received a coaching session, all via videoconferencing. Results indicated a potential relationship between training and the caregivers' use of the naturalistic language facilitation strategies as evidenced by caregivers showing increased ability to use a target skill - reciprocity. In addition, participants stated overall positive perceptions toward their participation in the study, both pre- and post-participation. Discussion of the study's key findings, limitations, future research, and practical implications is included.

KEYWORDS: deaf/hard of hearing; preschool; early childhood; early intervention; communication facilitation; language strategies; language development; vocabulary; speech-language pathology; deaf education; parent coaching

TRAINING CAREGIVERS OF YOUNG CHILDREN WHO ARE DEAF/HARD OF
HEARING TO IMPLEMENT COMMUNICATION FACILITATION STRATEGIES

RACHEL LYNN WELLS

A Dissertation Submitted in Partial
Fulfillment of the Requirements
for the Degree of

DOCTOR OF EDUCATION

Department of Special Education

ILLINOIS STATE UNIVERSITY

2023

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TRAINING CAREGIVERS OF YOUNG CHILDREN WHO ARE DEAF/HARD OF
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RACHEL LYNN WELLS

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R.L.W.

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CHAPTER I: INTRODUCTION

Early childhood is a complex and important period of an individual's life during which countless systems of the body undergo rapid changes as children are expected to obtain a plethora of skills in a relatively short period of time. Much of the time, these changes happen on a predictable trajectory. For example, we can expect that most typically developing babies will sit independently between six and nine months of age, crawl between six and 12 months of age, take his/her first independent steps between 11 and 13 months, and use a first word between 10 and 14 months of age (Center for Disease Control, 2021). However, there are instances during which some or many aspects of development either do not occur or take place in a delayed or disordered fashion (Bruder, 2010).

According to a large study ($N=88,530$) conducted by the Centers for Disease Control and Prevention (CDC, 2021), one in six children in the United States presented with a developmental disability in the years 2009-2017. According to the United States Census Bureau, approximately 4.3% of United States' population of children under 18 years old have a disability. This represents over three million children (U.S. Census Bureau, 2021). Delays in development may occur in one or more of the developmental domains of cognition, social/emotional development, motor/physical development, adaptive/self-help skills, and communication.

Different interventions may be utilized to target remediation of delays and disorders in areas of development related to communication. Specifically, those focusing on improving speech, language, and/or hearing skills during the early childhood (birth to eight years of age) years will be discussed. Team members who may be involved in communication-related interventions are outlined, but particular focus is on the roles and responsibilities of speech-language pathologists (SLPs).

We know that the development of successful communication skills relies on many factors, both intrinsic and extrinsic (American Speech-Language-Hearing Association [ASHA], 2008). The presence of any of a variety of developmental delays or disabilities may complicate a child's ability to grow into a successful independent communicator. Practical considerations for practitioners to consider when working with young children who present with delays or disorders in these areas are suggested in this paper.

According to the National Institute on Deafness and Other Communication Disorders (NIDCD, 2017), 7.7% of children aged 3-18 present with a language, voice, or swallowing disorder and 5% of children aged 3-18 present with a speech sound disorder. Furthermore, the Center for Disease Control and Prevention (CDC, 2019) states that two to three children out of every 1000 are born with hearing loss (a detectable level of loss either unilaterally or bilaterally), with approximately 1.7 out of every 1000 born with permanent hearing loss.

While these numbers might appear to be small, when you consider that the population of the United States is over 329.5 million people (in the year 2020) and there were over 3.5 million births in the year 2021, we can calculate that there are actually a large number of lives affected within these statistics. The statistic "Two to three children out of every 1000 born with hearing loss" means that there were roughly 8,000 to 12,000 children born with hearing loss in the US in the year 2021.

Implementing early childhood intervention services (which may include speech/language therapy, audiology services, developmental therapy, occupational therapy, and/or other services) targeting skills related to speech, language, and hearing development when children are within the birth to age eight range is something that, when conducted with best practices, includes a team of individuals. Families, practitioners (including teachers, therapists, and others), and the

child him/herself each have unique roles in the therapeutic relationship. The three areas of development discussed here (hearing, speech, and language) have many interwoven qualities, however there are important unique considerations for each area as well. Furthermore, the location(s) in which services are delivered brings additional considerations. A child's natural environment, a school or other center, a clinic, and telepractice based services (e.g. online therapy, tele-therapy, digital interventions) in a home or other setting each have advantages and challenges to consider.

There are a number of governing bodies responsible for ensuring children with disabilities receive appropriate interventions during the early childhood years. First, Early Intervention (EI) services are provided for children with developmental delays from the time of their birth through age three through individual states in the United States of America. Once a child turns three years of age, children receive those services that are deemed appropriate through the local school district. Services under EI are governed at the individual state level and services through school districts are governed at the federal level. While there are differences in governing bodies, there are similarities to the considerations to planning therapy for young children within both age ranges.

Early Childhood Intervention

As previously stated, "early childhood" is generally accepted to mean the period that spans between birth and eight years of age. More specifically, "Early Intervention" (EI) is often considered to be intervention that occurs when a child is between birth and three years of age. This paper will provide information on intervention considerations for the entire "early childhood" span.

The importance of early intervention for children with delays in any areas of development has been lauded by many researchers and practitioners alike (Guralnick, 2005). For

children who present with delays in speech and/or language, and/or present with any degree of hearing loss, intervening early for best outcomes is suggested and supported by research. A child's developmental trajectory is able to be positively affected by intervention services that take place as early as possible in the child's life (ASHA, 2008). The early years, critical for all children, are even more precious in the lives of children with disabilities. These years are when the foundations for development are laid and interventions targeting specific skills can have the most effect. In addition, the framework for family supports should be set during these early years. Future expenses and burdens on school districts and communities can be decreased with purposeful and effective early interventions because fewer interventions may be needed later on in a child's life (Bruder, 2010; Carta & Kong, 2007).

Furthermore, services for children with disabilities are mandated by federal law. This includes children in three age-groups, from birth to age twenty-one: birth to age three (falling under the "Early Intervention" umbrella), preschool (ages three to five), and ages three to 21. IDEA mandates that all children with disabilities receive a free and appropriate public education (FAPE) and are educated in the least restrictive environment (LRE). Public Law 99-457 was passed in 1986 to amend IDEA (20 U.S.C. Secs. 1471 et seq.) to specifically mandate preschool services for all children who have disabilities. IDEA Part B (Section 619) gives all children all rights and protections under the law. In addition, the amendments to IDEA in 1986 stated that individual states within the United States of America were to implement systems through which to provide services to children who have disabilities in the birth to three age range and their families. Ideally, a child (for those who have disabilities present at birth or soon after) would be identified as having a disability as early as possible so that he or she could receive appropriate supports as soon as possible.

While most researchers and practitioners would agree that early intervention for children with delayed development is crucial, there can be many challenges that stand in the way of effective service delivery. Some of these challenges are due to the fact that there is no “one size fits all” or cookie-cutter approach to early childhood intervention. That is, services are individually tailored to fit the needs of each child and family. Each child (even two children who have identical medical diagnoses) is different and each child’s family situation is unique. Planned services must take into consideration the child’s skills and deficits, as well as the family’s priorities while also fulfilling the legal obligations that are put into place that dictate how services should be provided to young children with disabilities (ASHA, 2008). Additionally, children may present with delays in more than one area of development which can further complicate the planning of intervention services. Intervention plans should focus on the specific skills and deficits that a child exhibits and not simply on any specific diagnosis(es) that may be present.

Prior to implementing any kind of intervention services, a child must be identified as having or suspected of having a delay or disorder in one or more areas of development. A child’s family may or may not be the ones who first notice that something is awry with the child’s development. A family friend, relative, doctor, teacher, or other individual in their life may be the one who first recognizes the delay or disorder. Once a delay or disorder is suspected, an evaluation by appropriate professionals is warranted. The evaluating person or team who is consulted varies depending on the age of the child and the specific concerns observed in the child’s development, however the family should always be an integral part of the evaluation process (Guralnick, 2005; 2011).

Following the evaluation, the evaluating professional or team communicates the results to the child's family and, together, the team (including the family) determines a plan for intervention that may include direct intervention services or therapy with one or more professionals. The child's unique combination of strengths and deficits, as well as the family's priorities for their child and specific goals and needs, should be taken into account when planning treatment for the child (ASHA, 2008).

The areas of speech, language, and hearing (which are components of the communication domain of development) are just three of the areas of development that could be developing in a delayed or disordered fashion in a young child. Next, we will investigate these three areas, including the specific unique characteristics of each as well as the interrelated or overlapping components. A variety of professionals may be a part of a child's care team when he or she presents with hearing, speech, and/or language delays or disorders and implications for these service delivery professionals will be discussed as well.

Early Childhood Intervention for Hearing Development

In individuals who present with congenital hearing, lack of access to language in the home can adversely affect an individual's global development, including speech and language development, academic achievement, and social-emotional development. The National Institutes of Health's (NIH) Consensus Development Conference on Early Identification of Hearing Loss (1993) stated that all infants should be screened for hearing loss, ideally before the infant is discharged from the hospital following birth. The Hearing Screening for Newborns Act (1999) mandated that all newborns undergo a hearing screening following birth. The implementation of these newborn hearing screenings resulted in more children being identified with hearing loss prior to 3 months of age (Center for Disease Control and Prevention, 2011).

ASHA, in a 2007 position statement, stated that screening a child for hearing loss and identifying a child as deaf/hard of hearing (D/HH) is only one part of the intervention process. Following identification, children who are D/HH must be set up with appropriate interventions with qualified service providers so that they are best able to reach his or her potential. Additionally, it is crucial that parents/caregivers receive meaningful and functional support to navigate the many choices and supports that may be required in order for their child to meet his or her full potential (Bradham et al., 2011).

Among the important choices that parents/caregivers of children who are identified as deaf or hard of hearing must navigate is language modality. Choosing a language modality (spoken language, manual/visual language, or a combination) and providing input within this modality as early as possible may increase the likelihood of the child becoming a successful communicator within the chosen modality (Moeller, 2000). Specific options and considerations are discussed in more detail later within this paper.

Intervention for children who exhibit hearing loss or deafness is often administered by a Teacher of the Deaf, a Developmental Therapist who is credentialed in Hearing, a Speech-Language Pathologist (SLP), and/or an audiologist. Deafness or hearing loss in infants can negatively impact speech and language acquisition, social and emotional development, and later academic achievement (Shojaei et al., 2016). However, if identified and intervention in the family's chosen modality is implemented, these negative impacts can be reduced and perhaps even eliminated through early intervention (Shojaei et al., 2016).

Table 1 illustrates some of the milestones that children with typically developing hearing skills exhibit at specific ages. While it is certainly a possibility that a child may have a reason other than hearing loss to exhibit deficits in the following skills, if there is an absence of these

skills at the ages indicated it should be recommended that the child undergo a hearing evaluation with an audiologist to rule out any degree of hearing loss as having an impact on the child’s development. Following the diagnosis of any degree of hearing loss, if one is present, further evaluations will likely be recommended, including an evaluation of speech and language skills by an SLP. Following all evaluations, a plan for treatment will be created that should take into account information from the entire team of individuals involved with the child’s care, including the family.

Table 1

Typical Hearing Development Milestones

Age	Skills Exhibited by Typically Developing Children
0 to 3 months	Loud sounds cause a startle reaction; quiets to caregiver voice
4 to 6 months	Attends to music; eyes look toward a sound source
7 to 12 months	Looks and turns head to sound source
1 to 2 years	Follows 1-step directives; listens to simple stories, rhymes, songs
2 to 3 years	Follows 2-step directives
3 to 4 years	Responds to a call from a communicative partner in another room
4 to 5 years	Follows more complex multi-step directives

Note. Adapted from “How Does Your Child Hear and Talk?” by ASHA, n.d.

Similar to the areas of speech and language, discussed previously, there will likely be a number of professionals working with a child when concerns are brought up regarding hearing skills. However, unlike the areas of speech and language for which an SLP is likely one of the first evaluators called in, an audiologist should be involved with any child for whom there are concerns with hearing as early as possible. An audiologist will be able to determine the type and

severity of the loss and will be able to begin counseling and educating the family on amplification tools (if desired) and communication modalities. Others potentially involved with the care of a child with hearing loss includes pediatricians, developmental therapists, preschool teachers, regular education teachers, special education teachers, teachers of the deaf, psychologists, and others.

It is critical that anyone working with young children knows warning signs related to potential hearing loss so that a referral for an audiological evaluation could be made as early as possible. As with the areas of speech and language, we know that it is important for intervention to take place as early as possible in the interest of working toward the best possible outcomes for the child. Research has shown that young children with hearing loss who were enrolled in intervention early (e.g. 11 months of age) had higher language outcomes than children who were began receiving intervention later on (Moeller, 2000).

Early Childhood Intervention for Speech Development

The term speech refers the way that sounds and words are produced. Speech includes articulation (how the lips, tongue, teeth, and palate work together to make sounds), voice (how the vocal folds and breath stream produce sounds), and fluency (the rhythm or flow of speech) (ASHA, n.d.). While speech is a skill that does develop without issue in a majority of individuals, it actually requires precise coordination of a number of body systems and is rather complex. As with other skills, children are not born with the ability to produce speech in the way that they are later able to do as adults or older children.

While children are not born able to speak in an adult fashion, they are typically born with a predisposition to developing speech that begins in utero. Following birth, a child's speech skills develop in a predictable way over the first five plus years of his or her life and are briefly

illustrated in Table 2(ASHA, n.d). While slight deviations from these milestones may occur, speech development occurs most often in this manner.

Table 2

Typical Speech Development Milestones

Age	Skills Exhibited by Typically Developing Children
0 to 3 months	Production of coos, smiles; different cries for different needs
4 to 6 months	Production of consonant sounds including m, b, p; babble; giggles
7 to 12 months	Production of long strings of sounds/gestures; imitates sounds; 1-2 words
1 to 2 years	Production of the consonant sounds p, b, m, h, w
2 to 3 years	Production of the consonant sounds k, g, f, t, d, n
3 to 4 years	Production of speech that most people can understand
4 to 5 years	A child is generally 100% intelligible (able to be understood) by age 5*

Note. Adapted from “How Does Your Child Hear and Talk?” by ASHA, n.d.

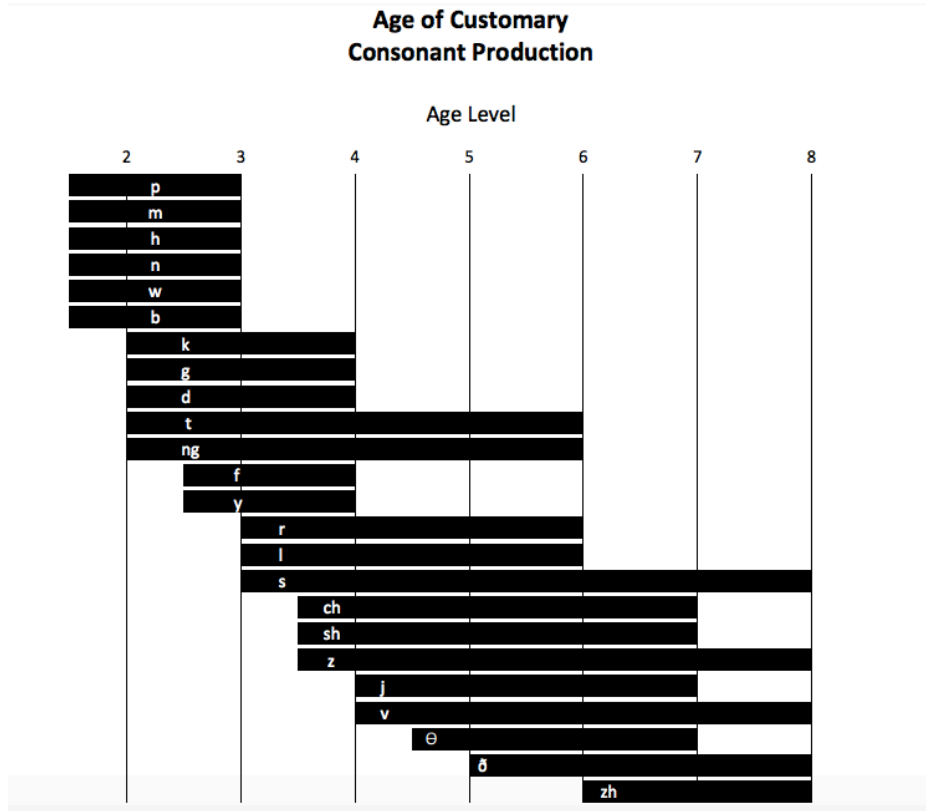
*”100% intelligible” refers to all or nearly all of a child’s speech being able to be understood by listeners in spite of minor articulation errors. This does not mean that the child will not have any residual developmental errors in articulation. A child’s speech sound system may not be fully intact until age eight (Pena-Brooks & Hedge, 2007; Sander, 1972).

In addition to the underlying skills that precede mastery of clear speech sound production, researchers have established normative data related to the mastery of production of specific sounds in American English. Figure 1 shows the consonant sounds in American English and details the ages at which children typically master each sound. The solid black bars start at the age at which children are generally able to start producing the sound and stop at the age at which 90% of children are able to produce the sound in a consistent manner (Templin, 1957; Wellman et al., 1931). Knowledge of this kind of information is important for those working

with young children so that realistic expectations of speech sound production skills are maintained. That is, we would not target production of a sound that a child is not yet of the age at which production is expected.

Figure 1

Age of Customary Consonant Production



Note. Reprinted from “Age of Customary Consonant Production,” by Sander, E. K., 1972, *Journal of Speech and Hearing Disorders*, 37, p. 63.

If a child’s speech sound skills appear to be developing in a delayed or disordered fashion that is concerning to the child’s parents, an evaluation may be administered by an SLP. The evaluating SLP typically uses a combination of standardized assessments, more informal observations of the child, and parental and/or teacher interview to gain a full picture of the child’s skills and deficits. When a parent, caregiver, or teacher reports on a child’s skills with

statements such as, “I can’t understand anything he is saying,” “She always leaves the ending sound off of words,” or “She never makes an “R” sound the right way,” the SLP is typically alerted to the fact that a speech sound delay or disorder could be the cause.

Other professionals who work with young children who should be aware of speech sound development norms and potential indicators of delays or disorders include pediatricians, developmental therapists, psychologists, occupational therapists, physical therapists, teachers of the deaf, special education teachers, regular education teachers, and daycare providers. While not all of these individuals would be expected to provide intervention to remediate a speech sound delay or disorder, having the knowledge of when to refer a child for outside or additional services is crucial for everyone who works with (or has) young children.

Early Childhood Intervention for Language Development

The term language development, for the purposes of this paper, includes both spoken language, signed language, and language communicated through Augmentative and Alternative Communication (AAC). The development of a successful language system is crucial in order for individuals to fully experience life as a human being so that they are able to communicate wants, needs, and ideas as well as understand communication from others (ASHA, 2007). Language includes the areas of syntax, morphology, semantics, phonology, and pragmatics. Syntax refers to the rules of how words are combined to form sentences (including grammar). Morphology is defined as the rules of how the smallest units of language that have meaning (morphemes) are used in a language. Semantics involves the meaning of words and word combinations (vocabulary). Phonology is the study of the phonetic (speech sound) system in a specific language. Finally, pragmatics is the social use of language. Successful development of each of these five unique areas is essential to a child becoming a fully competent communicator.

Furthermore, the broad umbrella of “language” includes both receptive (understanding) and expressive (use of) language.

Table 3 outlines some language-related basic developmental milestones that occur in a predictable way in typically developing children. While, as in all areas of development, variations will occur, if deviations from these milestones are present, an evaluation of a child’s language skills may be warranted to determine if intervention would be prudent.

Table 3

Typical Language Development Milestones

Age	Skills Exhibited by Typically Developing Children
0 to 3 months	Production of cooing and pleasure sounds; Unique cries for different needs
4 to 6 months	Production of speech-like babble including a variety of consonant sounds
7 to 12 months	Production of purposeful babble (i.e. to gain attention)
1 to 2 years	Production of one word by first birthday; adds new words regularly
2 to 3 years	Production of a two-word phrase by age two; continues to add new words
3 to 4 years	Responds appropriately to some simple questions; retells simple stories
4 to 5 years	Production of detailed sentences; uses adult grammar

Note. Adapted from “How Does Your Child Hear and Talk?” by ASHA, n.d.

If a child’s language skills appear to be developing in a delayed or disordered fashion, an evaluation may be administered by an SLP. Similar to what was described previously related to a speech sound evaluation, the evaluating SLP typically uses a combination of standardized assessments, informal observations of the child (a language sample gathered during play, for example), and parental and/or teacher interview to gain a full picture of the child’s skills and deficits. When a parent, caregiver, teacher, or other individual describes concerns with a child’s development with statements such as, “She only one or two words for everything she wants to

say,” or “He doesn’t follow routines the way his peer does,” or “His sentences don’t make sense,” the SLP is typically alerted to the fact that a language delay or disorder could be at play.

As described previously related to speech sound development, anyone who works with (or has) young children should know language development related norms, or at the very least know where to look to find this information if there are potential concerns regarding a child’s skills. While an SLP is a likely team member for a child who presents with a language delay or disorder, many other professionals may work on evaluating or remediating language skills as well. This may include regular educators, special educators, teachers of the deaf, preschool teachers, developmental therapists, and psychologists.

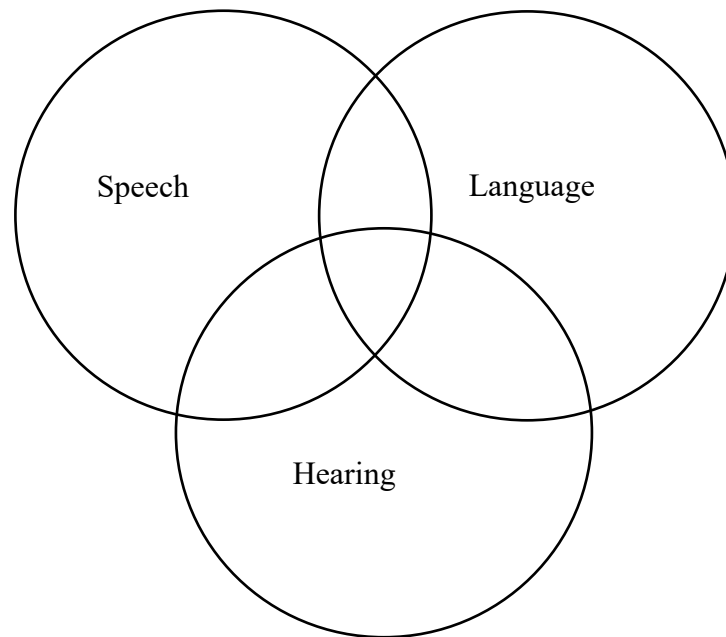
Interrelatedness of Hearing, Speech, and Language Intervention in Early Childhood

As discussed, the skills of hearing, speech, and language each have unique characteristics. Simply put, “hearing” refers to the receiving and interpretation of sound, “speech” refers to the production of sounds, “language” refers to the use of vocabulary including single words and connected words/sentences. However, these skills have interrelated qualities and the three areas are interwoven and not able to be truly free of the others. For a child who presents with issues in one area, there are often effects on other areas. When a child presents with delays or disordered development in more than one of these areas, it is often more complicated than presenting with a delay or disorder in just one of the areas.

Language skills have an effect on and are affected by a person’s speech and hearing skills. Likewise, hearing skills are affected by speech and language skills and has an effect on each. Furthermore, speech skills are affected by both hearing and language skills. As Figure 2 illustrates, each of these areas of development has its own components and each of these areas is colored by the others.

Figure 2

Overlap between speech, language, and hearing skills



Note. Visual illustration of the overlapping relationship between speech, language, and hearing skills.

One important similarity between the three areas is that, for children who present with delays or disorders in any of the areas, early identification and subsequently early implementation of appropriate intervention services is paramount for better outcomes. It is crucial that those working with young children maximize the years of early development by providing targeted interventions to build skills in areas of deficit so that the child has the best possible chance at making functional progress in areas of deficit (Moeller, 2000). Functional progress will be unique for each individual child; however, such progress may include skill development such as improved ability to produce speech, increased language skills, and/or better ability to utilize hearing. In order to effectively plan and implement intervention, it is important that interventionists consider first the needs and priorities of the family for their child, followed

by the unique skills and areas of deficit of the specific child, and age-level normative data related to each area so that appropriate and realistic expectations are maintained.

Effects of Hearing Skills on Language and Speech Skills

Language acquisition (including the non-verbal building blocks for language) begins early on in a child's life and is affected by the type of input a child receives. That is, if a child's language input is diminished or eliminated secondary to a hearing loss, speech and language development may be hindered (Akamoglu & Dinnebeil, 2015). There are multiple factors related to hearing loss that may have an effect on speech and language development. The age at which a child is identified as having a hearing loss may have an effect on the development of speech and language (DesJardin, Martinez, Ambrose, & Eisenberg, 2009). Additionally, family/caregiver understanding, support, and advocacy related to the child's hearing loss can have an effect. Other factors related to hearing that may impact speech and language development include: the type and degree of hearing loss, the age at which the child receives amplification (if the family chooses amplification) and begins using the amplification regularly, the type of intervention/therapy received, parent/caregiver involvement in intervention, and other concomitant diagnoses (Watkin et al., 2007).

A family of a child with a hearing loss should be counseled as early as possible regarding amplification options (such as a hearing aid or cochlear implant) that are appropriate for the child if the family wishes to explore those options. First, a family should be provided with the information needed in order to make an informed decision regarding communication modality. Generally speaking, communication modality categories for individuals who are D/HH (Deaf/Hard of hearing) fall into (a) listening and spoken language modalities (LSL), (b) manual approaches (e.g. Signed Exact English [SEE] and American Sign Language [ASL]), and (c)

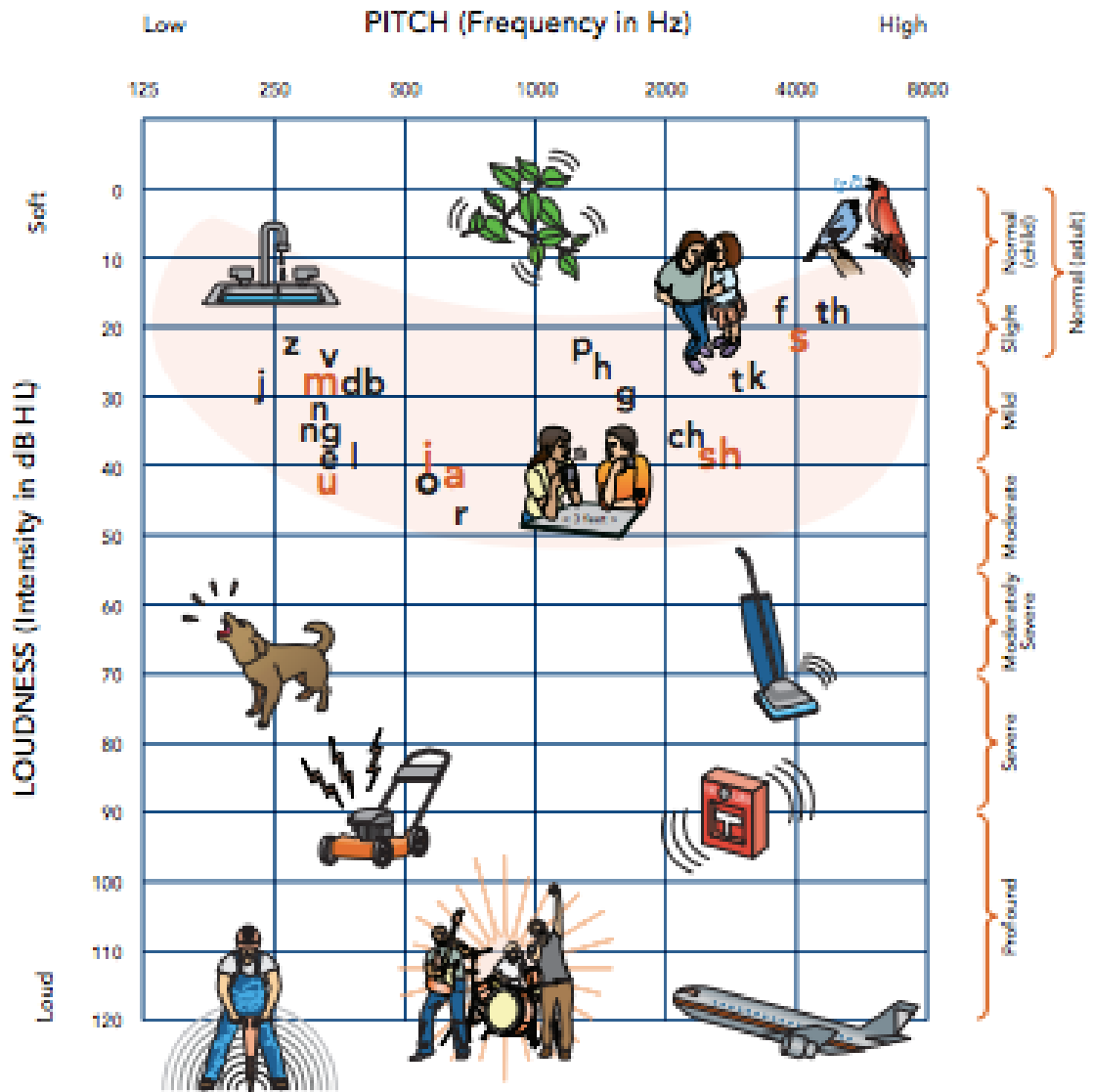
combined approaches (e.g. Total Communication [TC] and Cued Speech). There are many potentially complex emotions and thoughts a family may have pertaining to decisions related to amplification and communication modality options. It is imperative that all families receive comprehensive information related to the decision-making process by professionals who know and understand the specifics of the options and who have the skills to deliver the information in an unbiased and respectful manner. This will help ensure that the family feels comfortable making the choice that is best for their child and their family's specific situation.

Difficulty or inability to hear sounds at different frequencies may have an effect on a child's ability to produce the sounds. Simply put, it can be difficult to say sounds and words that you cannot hear. Figure 3 shows the frequencies at which different sounds are perceived. A child will not be able to hear sounds above the frequency of his or her loss without successful amplification. However, not all hearing losses are able to be remediated with amplification, and, furthermore, not all individuals with hearing loss will use amplification.

Depending on the level of loss that an individual presents with as well as the presence or absence of effective amplification, some sounds may be difficult or perhaps impossible to produce without additional visual and/or tactile teaching strategies. For example, a child who presents with a high frequency loss at and above 4000 Hz would have difficulty hearing and producing the sounds associated with the letter S and the digraph TH. It is of the utmost importance that anyone working with a child who presents with hearing loss on speech and/or language interventions understands the child's hearing loss and has reasonable expectations related to the child's spoken output.

Figure 3

Familiar Sound Audiogram.



Note. Adapted from the American Academy of Audiology and Northern, J. and Downs, M. (2002). *Hearing in Children* (5th ed.). Lippincott Williams and Wilkins, Baltimore, Maryland.

Some research has indicated that school-aged children who present with hearing loss who have been able to develop good speech perception skills through proper amplification and focused intervention may also be able to develop higher spoken language development than those students who do not have well-developed speech perception skills (DesJardin et al.,2009).

However, even with targeted intervention, language skill gains in children who are D/HH have been shown to take place at a slower rate than in children who do not present with a hearing loss (Blamey et al., 2001). Therefore, in order for the best outcomes to be possible, identification of hearing loss and targeted interventions in the family's chosen modality should take place as early on in the child's life as possible (Moeller, 2000; White, 2006).

Effects of Speech Skills on Language and Hearing Development

Clear speech sound skills affect the ability of a child to be understood by others and affect the language that a child is able to use. For example, a child with a severe articulation disorder may not be able to successfully produce multi-syllabic words or lengthy sentences secondary to his or her difficulties producing the sounds and not because of an underlying language disorder. Delayed or disordered speech production skills can also hinder a child's ability to express what he or she hears.

Effects of Language Skills on Speech and Hearing Development

A young child with delayed language skills manifesting as decreased verbal output will likely be producing very limited speech sounds. The child may have no issues with the oral structures necessary to produce speech but due to language difficulties is not able to use words to communicate. Additionally, a child with delayed language skills may not be able to apply meaning to auditory input. This means that, in spite of functional hearing the child is not able to successfully understand oral information.

In summary, the areas of speech, language, and hearing development are unique yet interrelated. If a child presents with a detected delay in one of these areas, it is suggested that the other two related areas be investigated as well. Delays or disordered development in one of these

three areas could have an effect on the the other areas, and gains in one area could help promote growth in the other areas as well.

Early Childhood Intervention Service Delivery Locations

There are a variety of locations where early childhood intervention services could be delivered and it is important for those who are on service delivery teams to understand each – including potential advantages and drawbacks for each unique location. These locations may include the following: the natural environment (which includes a family’s home), a school setting (may include a public or private school setting), a clinic setting (an outpatient or inpatient facility), and telepractice or teleintervention (using technology such as video conferencing through which the potential for location is truly limitless).

Examples of each of these locations are described in Table 4. There are undoubtedly advantages and disadvantages within each of these settings; some locations may not be accessible to some children and families for one reason or another (e.g., transportation complications, cost, restraints related to time commitments required for travel). The decision for where interventions are located should consider the child’s best interests, the family’s priorities and abilities, and include input from the intervention team.

Table 4

Potential Locations for Early Childhood Intervention Service Delivery

Setting	Description/Examples
Natural Environment	Family’s home; community settings where children with disabilities and children without disabilities could both be found
School	Neighborhood school; church preschool; private school; university laboratory school
Clinic	Private practice therapy office; doctor’s office; university clinic; health care clinic
Teleintervention/Telepractice	Using technology (such as Skype) to link a clinician/practitioner to a client for service delivery; connecting a practitioner to a family in a rural area far from one another

Note. A variety of different service delivery locations exist related to early childhood intervention service delivery.

Natural Environment

Part C of IDEA (Individuals with Disabilities Education Improvement Act [IDEA], 2004) mandates that Early Intervention services for babies and toddlers be conducted in natural environments. A natural environment is most often considered to be a family’s home. However, the term “natural environment” can more broadly include community settings where both children without disabilities and children with disabilities could be found participating in a variety of activities. Examples of natural environments (other than homes) include: parks, playgrounds, churches, daycares, libraries, and children’s museums. Natural environments provide many unique and salient opportunities for language and learning to be embedded within ordinary-seeming activities. Natural environments, familiar and comfortable places where a child

spends much of his or her time with family, caregivers, and friends, can be strong nurturers of new skills.

The Workgroup on Principles and Practices in Natural Environments exists to help clarify best practices in providing early intervention services within natural environments and disseminates information related to defining how early intervention service providers should implement these services. In 2008, this workgroup released a statement that included a table that shares seven key principles of what early intervention services within the natural environment should look like versus what these services should not look like. These principles are crucial to consider when the child’s team prepares the Individualized Family Service Plan (IFSP), a document that outlines the child’s therapeutic programming. The information in this workgroup’s statement is summarized in Table 5 and includes descriptions and examples of each of the seven key principles. These principles help guide individuals who work within early intervention in best practices in service delivery. They also can help describe what families can expect to experience as part of effective early intervention services.

Table 5

Seven Key Principles of Early Intervention Service Delivery within Natural Environments

Key Principle	Description/Examples
Infants and toddlers learn best through everyday experiences and interactions with familiar people in familiar contexts.	Attempt to use toys and materials regularly available to the child and family within their home or other natural environment and show families how these ordinary items can become tools to assist development.
All families, with the necessary supports and resources, can enhance their children’s learning and development.	Assume all families want to and are able to participate in their child’s early intervention services and refrain from passing judgment on a family based on their financial (or other) situation(s).

(Table Continues)

(Table Continued)

Key Principle	Description/Examples
The primary role of the service provider in early intervention is to work with and support the family members and caregivers in a child's life.	Show families how to incorporate therapeutic strategies and activities into daily routines in ways that help the family maintain their usual routine and schedules in an uncomplicated and non-invasive manner.
The early intervention process, from initial contacts through transition, must be dynamic and individualized to reflect the child's and family members' preferences, learning styles and cultural beliefs.	Seek to understand each family's unique background and priorities and strive to involve each member of the family in the child's intervention services while showing each family member that he/she is important and has valuable input related to the child's intervention.
IFSP outcomes must be functional and based on children's and families' needs and priorities	Writing IFSP outcomes/goals based on the families' unique concerns, resources, and priorities and considering how to best help the family achieve their goals.
The family's priorities, needs and interests are addressed most appropriately by a primary provider who represents and receives team and community support.	The child's team should be in regular contact with one another to share updates as well as any changes in/with the child and family. One provider should lead the team and take responsibility for coordinating care and dissemination of information.
Interventions with young children and family members must be based on explicit principles, validated practices, best available research and relevant laws and regulations.	Team members must make it a priority to stay informed regarding current research, regulations, and laws in their related field(s) to ensure that interventions being provided are in line with best practices. Regular data should be collected to ensure progress is being made and adjustments to IFSP made with team input as warranted.

Note. Adapted from “Seven Key Principles: Looks Like/Doesn’t Look Like,” by the Workgroup on Principles and Practices in Natural Environments, OSEP TA Community of Practice: Part C Settings, 2008.

School-based

For school-aged children (age three through 21) who have disabilities, often interventions take place in the school environment due in part to the fact that it is mandated that children with

disabilities receive free and appropriate education (FAPE) in their least restrictive environment (LRE) thanks to The Individuals with Disabilities Education Act (IDEA). Interventions may take place in the classroom with peers, outside of the classroom, or a combination of the two. Interventions may be one-on-one (one student with one adult conducting the intervention), within a small group, or with an entire class. Locations and structure of school-based interventions are dictated by each student's Individualized Education Plan (IEP) which is developed by the child's team (parents, teachers, therapists, and any others involved with his or her care).

Clinic-based

Clinic-based services are provided in any of a variety of medical settings, including hospital clinics, outpatient rehabilitation facilities, and inpatient rehabilitation facilities (e.g. skilled care facilities, nursing homes). Clinics, of varying types, serve individuals throughout the lifespan, from birth through the end of life. It is suggested that clinic-based intervention services be used only when the team (including the family) determines that they are absolutely necessary and generally avoided for the Early Intervention population. Natural environments, as previously described, are the mandated location for EI services due to the positive effect interventions in natural environments have on young children.

Teleintervention

The use of teleintervention as a means for intervention service delivery is a markedly newer than other means of delivery due to the rise of and availability of technology. The term "teleintervention" was proposed by staff at Sound Beginnings, an early intervention and preschool program for children who are D/HH on the campus of Utah State University (Houston & Stredler-Brown, 2012). This term has come to mean a specific model of intervention services

that are provided through distance technology. “Telepractice” and “telehealth” are other terms that are seen in the literature and these three words are sometimes used interchangeably.

Practitioners in many health and education disciplines have begun using telehealth services to meet the needs of a wide variety of individuals.

Teleintervention has become an effective means for children and families who live in areas with limited interventionists to receive needed therapeutic services. The venue from which teleintervention occurs may vary and includes schools, homes, clinics, hospitals, childcare facilities, and skilled nursing facilities. Virtually anywhere a clinician is located could become a place from which teleintervention is implemented as long as proper technological tools are available and functioning properly.

An advantage of teleintervention is the fact that it can help families who live in rural or remote areas who have decreased access to high quality, appropriate services receive services from professionals that they would not otherwise receive. Children who have complex diagnoses or low incidence disabilities, such as hearing loss, require interventionists that specialize in their unique area(s) of need. Due to smaller numbers of specialized interventionists (e.g. SLPs who specialize in particular modalities of communication for individuals who are D/HH), it can be challenging for individuals who need specialized services to actually receive them. Telepractice can help increase access to specifically skilled practitioners (Houston & Stredler-Brown, 2012). Telepractice can also help decrease the amount of time that a child waits for needed services. For example, if a child is identified as needing speech therapy services in an area where there are many SLPs but high waiting lists due to full caseloads, the child could potentially receive teleintervention with an SLP who lives out of his or her hometown.

Increased travel time to and from some families' homes in these areas can be a burden on families, practitioners, or both. Teleintervention takes the travel piece out of the equation. Another potential positive aspect of teleintervention is an increased level of participation during therapy sessions by parents/families. Due to the fact that a practitioner is not present in the family's home, a parent or other caregiver must assist the child during therapy sessions.

Additionally, there is also naturally an increased level of provider-to-parent communication. These factors may all result in increased skill growth in the target child that would not have happened (or may have occurred more slowly) without the presence of teleintervention therapy services due to the fact that the parent/caregiver receives training and practice in intervention techniques/strategies from the professional during the teleintervention work (Blaiser, Edwards, Behl, & Munoz, 2012). Then, the parent/caregiver can implement these strategies throughout the week during typical family routines.

However, there are potential complications with teleintervention as a service delivery option as well. Successful teleintervention services can be expensive and therefore cost-prohibitive to some families and practitioners alike. Additionally, technology may not be reliable 100% of the time and complications may arise with devices themselves, internet signals, and a family's (or practitioner's) competence using the technology. While it is a promising option for many children and families who live in remote areas or far from specialists, it will not work for everyone. As with all aspects of early childhood intervention, the decision to explore and/or implement intervention through telepractice should be one made as a team and the family must be provided with adequate support in order to be best prepared to access services in this way (Houston & Stredler-Brown, 2012).

Team Members and Roles in Early Childhood Intervention

Early childhood intervention services should include an interdisciplinary team of individuals who each bring unique perspectives and skills to the table (Bruder, 2010). Teams may include a combination of the following: families, practitioners (of which there may be more than one on the team), and the child her/himself. Each member of the team is important and should be valued, respected, heard, and affirmed by the others.

Families

Including a family's desires and goals for their child and recognizing the parents' unique roles as the "expert" on their child is an *important* part of developing an effective team for delivering early childhood intervention (Guarlnick, 2005; 2011). Families, which may look differently or include different people within unique family units and/or homes, are a crucial yet sometimes overlooked component of early childhood intervention teams. Family involvement in intervention has positive effects on communication outcomes (Moeller, 2000).

The way that "family" is defined is truly up to the discretion of the family unit itself and may include anywhere from one caregiver to many extended family members (Bruder, 2010). Public Law 99-457 included recognition of the unique and important role that families have in the development of young children with disabilities. A family-centered approach to pediatric intervention services is recommended not just for children receiving Early Intervention services, but also for children who are 3-5 years old receiving preschool services, as well as for children receiving services through all pediatric years (through age twenty-one). While Early Intervention programs utilize IFSPs to develop and plan therapeutic intervention services for children who are birth to three, family-centered programming for children after age 3 is not always clearly defined.

In order for young children with disabilities to get the most out of therapeutic services, it is crucial that families receive thorough yet easy-to-understand, accessible information related to their child's unique needs. It is important for families to understand their child's unique strengths and deficits as well as the rationale behind the therapy being administered. Furthermore, the family needs to "buy in" to the therapy and carry over therapeutic principles into their home environment in order for the therapy to have the most value and success (Bailey et al., 2012). It is the responsibility of the individual practitioners/therapists to communicate with families in a way that allows them to best understand their child's needs and the therapeutic plan.

In 1986, Bailey et al. suggested that a 4-tiered model of family-focused intervention be utilized by pediatric practitioners including: (a) giving parents coping strategies for dealing with the unique challenges related to raising children with disabilities, (b) helping families understand the unique needs and development of their unique child, (c) fostering meaningful parent-child interactions across different environments, and (d) empowering parents as experts in their child and reinforcing the fact that the family has decision making power related to the services desired for the child.

In 2012, Bailey, Raspa and Fox suggested that family-focused intervention should do even more, including: (a) first and foremost focus on the family's strengths, (b) respect the fact that all families are unique and diverse and have unique values, (c) encourage families to make the best decisions possible for their unique family unit, (d) empower the family as the expert on the child, (e) communicate openly with the family regarding all aspects of therapeutic services, (f) include collaborating with the family and considering family members to be valuable members of the therapy team, (e) flexibility with service provision, and (f) recognizing the value of the family having a support system in place and helping to facilitate this when needed.

Family centered services are recommended for all individuals who receive pediatric therapy services, however there is limited data and research available regarding the effects of family-centered services compared to non-family centered services for children outside of early intervention. However, anecdotal information available from a number of pediatric organizations, therapists, and teachers as well as logic seems to suggest that family-centered services, regardless of the child's age, simply make sense for better pediatric developmental outcomes (Baily et al., 2012).

Some researchers have found that pediatric therapists (including SLPs and other disciplines) often have limited training in the area of collaborating with and teaching families how to implement therapeutic strategies within their home environments (Bailey et al., 1990), suggesting that perhaps more training in this area should be provided to these professionals.

There is a growing body of research suggesting that pediatric therapists should move one step further than family centered service delivery and shift from focusing on child outcomes to parent coaching-focused outcomes where therapists do not conduct direct conventional therapy services with a child him or herself, but instead provides coaching to the parents/caregivers of the child related to what the parent/caregiver can do with the child to increase skills in the target areas (Basu et al., 2010; Mahoney, 2009). While this is admittedly a large shift in thinking for many providers, it is perhaps a topic worth exploring more (Rush, 2018).

Parents/caregivers are with their children far more hours throughout a week than interventionists are and, besides this, have more insight into their child's unique personalities and desires and can be natural teachers (Friedman & Woods, 2012).

Parents/caregivers, under typical circumstances, are in a perfect position to use naturalistic teaching strategies within their child's daily life and sometimes simply need some

well-placed coaching and teaching in order to do so (Akamoglu & Dinnebeil, 2015). The Workgroup on Principles and Practices in Natural Environments (2008) asserted that all families can affect their own child's learning when they are provided with appropriate supports and resources to be prepared to do so.

They further stated that the primary role of service providers, specifically EI providers in this instance, is to work with and support family members and caregivers so that they are best able to teach their child. Families can be the first and most important change agents in the lives of their children and practitioners who work with the early childhood population must communicate this important truth to families in an effective manner (Swanson et al., 2011). While young children's service providers, including SLPs, are not always well-versed in teaching strategies that are effective when working with adults (i.e., parents/caregivers), learning these techniques can be helpful when working with families of children with disabilities so that information can be taught in a way that is most accessible and meaningful to them (Woods et al., 2011).

Practitioner knowledge and use of adult-learning strategies when working with families of young children is an important part of family-centered intervention (Friedman, Woods, & Salisbury, 2021). Adults learn differently than children and, in order for best acquisition of knowledge to take place, practitioners should utilize strategies that are shown to be effective with this population of learners. Adults' learning can be affected by many factors including life experiences, position in the life cycle, and acceptance of their role as a parent of a child with a disability and practitioners must consider the ways that differences in these aspects will shape service delivery (Bodner-Johnson, 2001). Open lines of communication between parents and

practitioners should exist at all times so that practitioners are best able to tailor intervention in order to most successfully meet the needs of the family.

Practitioners

A variety of practitioners may be involved on a child with a disability's intervention/care team. These practitioners may include: primary care physician, audiologist, speech-language pathologist, developmental therapists, occupational therapists, physical therapists, mental health professionals (including licensed clinical social workers or psychologists), teachers (including special education teachers, regular education teachers, teachers of the deaf), and others.

Each professional working with the child is governed by its own overseeing body regarding scope of practice and recommendations for best practices and/or a Code of Ethics related to professional practice. It is the responsibility of each professional to adhere to these guidelines. In the case of an SLP, one of the primary professionals who is likely working with a child who exhibits a disability in one or more communication-related areas, ASHA maintains a Code of Ethics, containing explicit rules for ethical practice. SLPs are explicitly tasked with involving parents in the therapeutic process (ASHA, 2008; Paul & Roth, 2011).

Child

The child her/himself is a very important part of the early childhood intervention team, which should never be overlooked. In an age-appropriate (or developmentally appropriate) manner, the child should be informed of his or her goals, taught self-awareness skills, and should play an active role in intervention. This can help a child take ownership of his or her development and may help increase the likelihood of positive outcomes, growth, and progress toward a child's goals. Self-determination, or the ability to be a motivated and self-regulated learner, in children with disabilities is being shown to have a positive effect on their overall

success as a learner (Martin et al., 2003). Obviously, an infant is communicated to in a far different way than a seven-year-old; it is important for practitioners to communicate goals and objectives to children in ways that he/she can understand just as it is important to tailor intervention goals and activities to each child in a unique manner.

Parenting style and parents' ways of interacting with and teaching their children can play a role in a child's academic skills, including literacy readiness (Wauters et al., 2021). For example, children who are deaf or hard of hearing who have parents who are less strict/controlling have been shown to have larger expressive vocabularies (Holt et al., 2012). Parents who are sensitive to their child's needs without being controlling can support better language outcomes in their children (Niparko et al., 2010).

Chapter Summary

Childhood is an important and complicated time during human development. The changes that a child endures and the skills that he or she is expected to develop are further complicated with the presentation of any level of delayed development. It is paramount that early childhood interventions for those who present with delays or disorders happen as early as possible and are individually tailored to each child and family's unique needs and priorities so that the child has the best opportunity for success and growth (Akamoglu & Dinnebeil, 2017; ASHA, 2008; Bruder, 2010; Friedman & Woods, 2012). There should be no argument that each child is unique and therefore the treatment of each child should revolve around his or her skills, deficits, interests, family priorities, and the family's overall situation.

Communication is a gift and is one of the things that makes us each uniquely human. Successful, functional communication development is a result of the interaction of an individual's speech, language, and hearing skills. Children who present with delays or disorders involving a combination of speech, language and/or hearing skills have complex needs. As such,

intervention planning requires input and expertise from a team of individuals regarding the skills and deficits in each of the affected areas. Specialists with concentrated training in each of the affected areas should be consulted when preparing appropriate treatment plans for intervention and, as always, families should be involved in the decision-making process.

There are a variety of locations that may be utilized when implementing communication intervention – natural environments/families’ homes, schools, and clinics. Additionally, the use of teletherapy opens up the possibility that therapy could happen in areas that are more difficult for practitioners to reach due to complicating factors such as travel and/or time/availability.

Researchers have found time and time again that earlier intervention yields better outcomes for children with disabilities (ASHA, 2008; Houston & Stredler-Brown, 2012; Moeller, 2000). Interventionists have the responsibility to provide these early intervention services in a manner that considers best practices and considers all of the qualities that makes a specific child unique. Research-based interventions delivered by qualified and competent practitioners in ways that tap into a child’s own interests and skills while empowering and educating the family to be prepared to facilitate learning in their own home environment in accessible manners delivered as early as possible can truly change the trajectory of a child’s entire life. One child’s changed life will change a family. One changed family will change a community. And, one changed community will change the world.

CHAPTER II: REVIEW OF RELATED LITERATURE

Multiple researchers have concluded that parent-implemented communication intervention can result in increased communication skills in young children (Akamoglu & Dinnebeil, 2017; Chen et al., 2007; Roberts & Kaiser, 2011). Parents are the first teachers of their children and are in natural positions in their role as caregivers to provide naturalistic communication intervention throughout their child's daily life within familiar environments. Professionals who work with young children with communication delays can play an important role in helping coach parents in therapeutic strategies to help facilitate increased communication skills in their children and teaching parents how to incorporate therapeutic techniques into their family's regular routines.

Parents may be included as an integral part of communication intervention (including speech and/or language interventions) by way of parent-professional dyads or parent-professional-child triads (Lieberman-Betz, 2015). A parent-professional dyad describes a parent and a professional working together with the professional providing coaching or training to the parent conducting intervention with the child who has a communication delay. A parent-professional-child triad describes a triangular relationship between a parent, professional, and child with a communication delay in which both the parent and the professional provide intervention to the child, and the parent also receives coaching from the professional regarding therapeutic strategies and techniques.

Researchers do not always use consistent terminology when describing implementation of parent-professional dyads or parent-professional-child triads and sometimes use the terms "dyad" and "triad" to mean the same practice. Regardless, the key principle at play is incorporating parents into communication intervention. Using parents as interventionists in dyads and triads is not only growing in the field of speech language pathology, but also in the

global field of pediatric therapy (Brown & Woods, 2016). Some researchers, including Kritzer and Pagliaro (2012) , have investigated the effectiveness of parent implemented intervention or instruction for skills other than communication. For example, these individuals look at math skills in young children who are deaf/hard of hearing and how parent instruction on mathematical concepts helps their skills progress.

Persistent language delays can negatively impact academic success as well as life outside of academics (Reed et al., 2008). Parent-implemented interventions during the early childhood years, when intervention for developmental delays is most crucial, can be a practical way to affect change in the communication skills of young children. In general, parents are present in their child's lives more frequently and consistently than interventionists are. Therefore, it seems to make sense to train and empower parents and caregivers in therapeutic techniques so that they are prepared to implement interventions in the home environment throughout the family's daily routines.

Roberts and Kaiser (2011) conducted a meta-analysis investigating the effects of parent-implemented language interventions on language skills of children between 18 and 60 months of age with diagnosed language delays. This meta-analysis included 18 experimental studies that compared groups of children who received parent implemented language intervention to groups of children who either did not receive direct intervention or received therapist-implemented intervention. Their review suggested that parent-implemented language intervention or instruction, for students with and students without disabilities, can result in increased language skills in children. It also revealed that parents who received direct training in therapeutic strategies were more responsive to their children throughout the course of the study.

Furthermore, research has indicated that children, both those with and without disabilities, show growth in language skills as a result of meaningful, every-day interactions with parents/caregivers (Chen et al., 2007). At times, however, parents and caregivers are unsure of how to best interact with their children in order to enhance language development and can benefit from coaching or teaching from professionals in order to feel better prepared to be a teacher to their children (Akamoglu & Dinnebeil, 2017). In addition, parents and caregivers often self-report or exhibit challenges interpreting and understanding communicative behaviors in their children, in particular if their child exhibits significant disabilities.

Therefore, there is benefit to parents and caregivers receiving explicit instruction in how to understand communicative behaviors in their children and what to do to help encourage further growth in communication skills (Chen et al., 2007). Research has also shown that early intervention (including during the preschool years) is vital to helping students with language delays catch up to peers who are typically developing (Boothroyd & Boothroyd-Turner, 2002).

Professionals who work with the early childhood population, including pediatric SLPs, are not always well-versed in teaching strategies that are effective when working with adults (i.e. parents/caregivers); learning effective techniques to foster adult learning can be helpful when working with families of children with disabilities so that information can be taught in a way that is most accessible and meaningful to them (Woods et al., 2011). As Kaiser and Roberts (2011) reported, parents are better able to be responsive to and interact in a manner that encourages language growth in their children when they receive coaching and instruction in effective techniques.

Some emerging research shows that parents can also learn strategies to enhance language skills in their children by observing other parents utilize these strategies with their children,

without being explicitly taught the techniques by a professional (Eid et al., 2017). Having untrained parents observe and learn from parents who are trained in explicit child communication techniques could be a less complex and more accessible way for parents to gain new skills in these areas as opposed to having to receive formal training from professionals.

A number of experimental studies have been conducted looking at the effectiveness of parent-implemented language intervention. Roberts and Kaiser (2012) conducted a pilot study investigating the effects of parent-implemented language intervention with toddlers. In this study, 34 child participants with diagnosed language impairments were split into two groups. The treatment group received triadic intervention (parent-implemented language intervention after being coached by a trainer), whereas the control group received no intervention. A third group of typical age- and gender-matched typically developing peers was also observed. The researchers found that the treatment group made greater gains in language skills compared to the non-treatment group after three months of intervention. Furthermore, following the intervention there was not a significant difference in language skills between the treatment group and the group of typically developing peers.

Later, Kaiser and Roberts (2013) conducted a group comparison study looking at two groups of children with language delays – the first group received focused intervention conducted solely by a therapist and the second group received focused intervention conducted by a therapist and a parent or caregiver. They found that, as a whole, the children in the study did make gains in language skill development. However, there were no significant differences in the group that received intervention by both a therapist and a parent/caregiver compared to the group that received intervention from only a therapist. The study did suggest that parents of children with communication delays are able to learn, generalize, and maintain therapeutic strategies to

use with their children to enhance language development. While this study was relatively small ($n = 77$), it does suggest that naturalistic language strategies do have a positive effect on language development in young children.

Brown and Woods (2016) conducted a study observing triadic relationships between interventionists, parents, and children with (a) children with Down Syndrome (DS), (b) Autism Spectrum Disorder (ASD), and (c) developmental delay (DD). They developed an explicit, sequential teaching system for disseminating intervention strategies to the parents to in turn use with their children and instructed parents in these techniques. These researchers stated that it is crucial to help parents move past reading from a script of intervention techniques and strategies to having true reciprocal interactions with their children, responding in real time to their children's communicative intent and productions. They found positive relationships between the parent participants' use of taught intervention strategies to increased language output by the child participants. These researchers suggested future research in the area of specific coaching strategies (or, perhaps, combinations of specific coaching strategies) and their impact on parent learning and successful implantation of techniques that positively affect child language and learning.

The present study aims to gather information from the body of research available on the topic of using parent-professional dyads and parent-professional-child triads for communication intervention in children within single case design studies. For the purposes of this review, single case design studies were chosen because these designs are most often used to evaluate the effect of interventions. Additionally, within single case studies, researchers typically provide extensive information pertaining to each participant, allowing for further analysis of the participants as a

group within the present study. Results of the literature review, limitations of the study, and implications for future research are discussed.

Research Questions

The purpose of this literature review is to investigate the use of parent-professional dyads and parent-professional-child triads in speech and language interventions. The following questions were asked:

- 1) Does the use of parent-professional dyads and parent-professional-child triads in speech and language intervention result in increased communication skills in children with communication delays?
- 2) What gaps in the body of research related to the use of parent-professional dyads and parent-professional-child triads in communication intervention exist?

Method

Literature Search

I used the following procedures to identify studies for inclusion in this review. First, I examined key electronic databases (i.e., PsychNET, ERIC, Medline, and ProQuest). Next, I conducted a hand search of related journals, and finally I conducted an ancestry search (i.e., review of reference lists from relevant published literature reviews).

The search was conducted using three different categories of search terms: (a) parents, (b) communication, and (c) disability. Dissertations, which are sometimes not included in systematic literature reviews, were included in this study in order to avoid publication bias (Gage, Cook, & Reichow, 2017). Search terms were chosen under three categories: (a) parents, (b) communication, and (c) disability. Specific search terms related to each category are listed in Table 6.

Following the search of electronic databases as described, I reviewed the reference lists of related literature reviews and meta-analyses identified through electronic searches, as well as hand-searched 9 journals typically associated with research in the area of communication intervention and speech-language pathology (e.g., *Augmentative and Alternative Communication*, *American Journal of Speech-Language Pathology*, *Journal of Applied Behavioral Analysis*, *Exceptional Children*, *Focus on Autism and Other Developmental Disabilities*, *Research and Practice for Persons with Severe Disabilities*, *Language and Speech*, *Language, Speech, and Hearing Services in Schools*, and *Journal of Speech, Language, and Hearing Research*). Hand searches were limited to studies published in the last twenty years, that is, between 1998 and 2018. A total of 5079 potentially relevant articles were initially revealed. After an elimination of all duplicate articles, irrelevant sources (including text books and book chapters), and studies that did not pertain to the focus of this study, a total of 152 potentially relevant studies remained in the literature list.

Selection Criteria

To determine whether the remaining 152 potentially relevant studies met the requirements for inclusion in the present study, I reviewed the abstract of each article and applied inclusion criteria. Studies were reviewed in this paper if they met the following inclusion criteria: (a) the study used a single-case research design, (b) the participants were birth to age 12 (and not in high school, for example), (c) the study included one or more children with a disability, (d) one or more dependent measures of child communication were included, and (e) the study included a parent-teacher dyad or parent-teacher-child triad for intervention. Single-case research design was chosen for the purposes of this review because of the detailed information available for analysis of individual participants within the study.

In cases in which the abstract did not provide sufficient information to effectively apply inclusion criteria, the full study was accessed online in order to be more closely investigated and analyzed. Ultimately, 47 studies met each of the five inclusion criteria and were therefore identified for inclusion in this literature review. See Figure 4 for an illustration of how the search process was conducted.

Coding Procedures

The remaining 47 articles were coded using a form based on a previous related systematic literature review (Snell et al., 2010) and a study investigating how parents use naturalistic language strategies in their homes (Curtiss et al., 2016). Individual study participants were treated as single units of analysis, and codes were identified for each participant across each coding item.

The coding form included 40 items of analysis that were categorized into six sections as follows: (a) child participant characteristics; (b) parent/caregiver characteristics; (c) parent/caregiver training/preparation characteristics; (d) information related to intervention delivered through parent-teacher dyads or parent-teacher-child triads; (e) research design; and (f) quality of study. gives a summary of the some of the key information garnered from the 47 articles included in this study.

Coding Reliability

The author (primary researcher) coded each of the 47 included articles and a second individual (a teacher of the deaf/hard of hearing) coded 10% ($n = 5$) of the total articles (randomly selected) in to analyze inter-rater reliability across descriptive study characteristics. Inter-rater reliability was calculated across each coding item by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100 to obtain a

percentage of agreement. The mean inter-rater reliability across all descriptive coding items was 95%.

Analysis

I utilized Microsoft Excel to calculate basic descriptive statistics including total numbers of participants and percentages of a variety of different participant characteristics (i.e., gender, age, ethnicity, school level, diagnosis, pre-intervention communication level, and pre-intervention communication mode). Statistics related to the following parent (or caregiver) participant characteristics were calculated: gender, age, ethnicity, educational level, employment, and prior training in language intervention.

Results

Findings of Descriptive Analyses

First, information about each study was obtained by systematically investigating the included studies. Information was synthesized in categories in order to gain more information about each area. Of the 47 studies, 12 used parent-professional-child triads and 35 used parent-child dyads for the intervention studies. The range of number child participants in the studies was one – nine, with the mean number of child participants being three.

Child Participant Characteristics

A total of 165 children participated in dyadic or triadic interventions across the 47 included studies. This included 127 (77%) males and 38 (23%) females. The mean age of child participants was 47 months with the range being 2 months–138 months (11 years, six months). provides information pertaining to school level, disability diagnosis, and pre-treatment communication status. Of the child participants for whom ethnicity was reported, a majority were White (26%). Fewer participants were Hispanic/Latino (9%), Black (6%), Native American/Pacific Islander (1%), and Bi-racial (1%). For 56% of child participants, there was no

data reported regarding ethnicity. Regarding pre-treatment language skills, 83% ($n = 137$) of child participants presented with delayed receptive language skills, 8.4% ($n = 14$) presented with receptive language skills within normal limits, and there was no information regarding receptive language skills for 13 participants (7.8%). Ninety-one percent ($n = 150$) of participants were reported to have delays in pre-treatment expressive language skills, 7.2% ($n = 12$) presented with expressive language skills within typical limits, and there was no information regarding expressive language skills for three participants (1.7%). A total of 152 (92.1%) child participants had one parent conducting intervention and 13 (7.9%) child participants had two parents providing intervention.

When investigating diagnoses of the participants, it is clear that an overwhelming majority of the participants analyzed had diagnoses of autism (64.2%; $n = 106$). Other disabilities had far less representation within the studies analyzed in this review: speech or language impairment (21.2%; $n = 32$), intellectual disability/DD (16.9%; $n = 28$), other health impairment (1.8%; $n = 3$), multiple disabilities (0.6%; $n = 1$), deafness (0.6%; $n = 1$), hearing loss (0.6%; $n = 1$), traumatic brain injury, (0.6%; $n = 1$), and orthopedic impairment (0.6%; $n = 1$). There was no diagnosis indicated for three of the participants (1.8%; $n = 3$) and two of the participants fell into the “other” category (1.2%; $n = 2$).

Parent Participants

A total of 177 parent/caregiver participants were involved with interventions across the 47 included studies. Of the total participants, 139 (84.2%) were female, 32 (19.4%) were male, and for six (3.6%) participants there was no information reported on gender. The range of ages that were reported for parent participants was 20 years–56 years, with a mean age of 36 years. Ethnicity was not reported for 116 (69.5%) of parent participants; however, for the parent participants that ethnic information was available, a majority were White (22%) with fewer

participants being Hispanic/Latino (5.4%) and Black (4.8%). provides information on parent participant educational level, occupation, and participation in language/communication intervention training prior to participation in the analyzed study.

Parent Training Characteristics

Each of the 47 studies included in this literature review featured a parent training component. In each study, prior to participating in a parent-professional dyad or parent-professional-child triad for intervention, the participating parent underwent training to learn intervention techniques. The difference in the dyads versus triads is that in the parent-professional dyads, the professional did not directly participate in intervention with the child. In the parent-professional-child triads, both the parent and the professional interacted with the child in a therapeutic manner. See for an illustration of the dyadic and triadic relationships.

In all studies, a professional (i.e. an experimenter, research assistant, or one or more therapists) conducted the parent training on intervention techniques. Further, the types of training used was also investigated. Experiential (defined as including conversational coaching and/or “hands-on” or “on the job” training experiences) and didactic (defined as including lecture-based workshops or classes) type trainings were coded. Of the total number of participants, 65.5% ($n = 108$) had caregivers undergo experiential training and 34.5% ($n = 57$) of the participants had caregivers undergo both experiential training and didactic training. No studies investigated within this review used solely didactic training. The duration of the training utilized in the investigated studies varied widely. Some studies did not clearly define or outline the duration of time that parent trainings took (21.9%; $n = 36$). For the studies that included information on the duration of parent training (78.1%; $n = 129$), training ranged in duration from a 1-time training to 1x/week for the entirety of the study’s duration.

Parent-Implemented Intervention Characteristics

While 100% of the analyzed studies and parent-child pairs included parents/caregivers implementing interventions with child participants after undergoing training with a professional (parent-professional dyads), some of the studies included professionals interacting with/providing interventions to the child participants as well. Professionals implemented interventions through parent-professional-child triads for 19.4% ($n = 32$) of participants (represented by 12 separate studies). provides a summary of important information related to the parent-implemented interventions/dyads and triads.

Frequency of interventions varied widely amongst the studies. Twenty-four studies (14.4%) did not include reports regarding the frequency of interventions and 20 (11.9%) studies did not report the total duration of the interventions. Of the studies that included information regarding frequency and duration, the range of frequency ranged from five times per day to one time per week. Likewise, there was a wide range of duration amongst the studies: one week to one year's time.

Some of the studies (15%) did not describe use of a specific training or intervention program, whereas a specific intervention program or curriculum was used in a majority of the studies (85%). Specific intervention programs included PLAI (Promoting Learning through Active Interaction), PECS (Picture Exchange Communication System), Floortime/DIR (Developmental Individual-difference Relationship-based Model), and Model-Lead-Coach. Not all studies went into detail regarding the training programs utilized; some stated more vaguely the fact that a training program was utilized but did not name it or fully describe it.

Study Quality

The quality of the included studies was investigated by considering the following elements: implementation fidelity of the parent-implemented intervention in each study,

dependent measure (child participant behavior/language skills), reliability, the inclusion of generalization measures, the inclusion of maintenance measures, and the inclusion of social validity measures. gives an illustration of the data related to the quality of the studies that were analyzed, as well as information regarding the research design of included studies and intervention outcomes measured. The author consulted Horner et al., 2005 when determining factors to use to assess quality of the single subject studies.

In general, the studies included adequate information (higher than 80% for each area, respectively) regarding the child and parent/caregiver participants, setting of the intervention sessions, and the intervention agents (individuals conducting the parent coaching/training in the dyads and/or conducting the intervention sessions in the triads). The 165 total participants were studied using two research designs: multiple baseline/multiple probe (97.6%; $n = 161$), alternating treatment (2.4%; $n = 4$). In addition, all of the studies included a description of the dependent measures of communication skills that were analyzed during the particular study. The skills (dependent measures) that were analyzed within each study varied, but each had the commonality of being related to communication. Skills targeted in each study included one or more of the following: receptive language, expressive language, multi-symbol productions (with an augmentative and alternative communication device), requesting, attending, vocabulary, verbal output/vocalizations, social engagement, play (an important pre-communication skill), communicative turns, fluency, and imitation.

While there were fidelity measures reported for 143 participants across the 47 studies, there were no fidelity of implementation measures reported for 22 participants (13.3%). A majority of the participants had dependent measure reliability measured and found to be at acceptable levels (92.1%; $n = 152$). However, 4.2% of participants studied ($n = 7$) did not have

acceptable dependent measure reliability, reliability was not measured for 3.6% ($n = 6$), and reliability was measured but could not be determined for 2.9% ($n = 5$).

Generalization probes were used in some of the studies reviewed here to determine if participants were able to generalize any of the newly gained skills into settings other than the primary setting used in intervention sessions. Generalization measures were present and observed with positive effects for only 51.5% ($n = 85$) of participants. There were no generalization measures present for 50.3% ($n = 83$) of participants, and generalization measures were present but without positive effects for 3.6% ($n = 6$) of participants.

Maintenance measures were present and observed with positive effects for 69.5% ($n = 116$) of participants, meaning there were probes a week or more following the cessation of intervention to see if the participants were able to maintain any of the newly gained skills. There were no maintenance measures present for 28.7% ($n = 48$) of participants, and maintenance measures were present but without positive effects in 2.9% ($n = 5$).

Social validity measures are used by researchers and/or interventionists to determine if participants find value in the target intervention and if they believe the study is doing what the researchers set out to do. Social validity measures were gathered with 123 parent participants. Social validity was not measured in 43 parent participants (26.0%). Social validity was measured and confirmed with 73.9% ($n = 122$) of the total parent participants and it was measured but not confirmed with 1 participant (0.6%).

It is important to note that it was indicated within the studies that a number of the participants ($n = 5$) ended participation early. This contributed slightly to some of the decreased numbers for the generalization, maintenance, and social validity measures because the participants ended participation prior to these stages of their respective studies.

Discussion

Synthesis of Findings

This literature review yielded a body of research on the topics of parent-professional dyads and parent-professional-child triads in early childhood language intervention. Overall, the quality of the studies analyzed was variable meaning results should be interpreted carefully. As previously reported, part of this could be accounted for factors that were out of the control of the researchers including the fact that there were some participants who dropped out of their respective studies for one reason or another prior to the end of their study.

As a whole, all of the studies investigated indicated that participants made gains in language skills during the intervention. However, as reported above, not all studies showed positive effects in generalization or maintenance probes. Some authors did not report on generalization and/or maintenance probes at all. Positive effects in generalization and maintenance probes strengthen single case design research (Horner et al., 2005).

Excluding studies that did not use a single case research design did undoubtedly leave out some potentially pertinent literature. For example, it is likely that there are group design studies that investigate parent-professional dyads and parent-professional-child triads and their use and effect on children's communication skills. For the purposes of this study, only those studies using single case research design were included because these are studies that most often provide detailed information about each participant. The author wished to have this rich participant data to analyze for the purposes of this paper in order to gain a better understanding of the individuals represented by this body of research.

While all of the studies analyzed did report child communication outcomes, there was not data in all of the studies related to parent outcomes. That is, not all studies explicitly reported on

the parent/caregivers' ability to successfully learn techniques and then to generalize these techniques to other settings and maintain knowledge and ability to use the techniques once the intervention/training ceased. Parent abilities in administering target interventions would likely affect child outcomes and related data could be valuable when considering planning a parent training program.

There was little continuity amongst the studies. For example, the duration of time parents were trained on intervention strategies as well as the frequency at which they received trainings varied widely. Additionally, the total duration of time of each intervention study varied in addition to the frequency of intervention sessions within each study. At times, frequencies and durations of parent training and intervention were not reported at all. These factors make the studies difficult to replicate. Additionally, it could be useful to be able to form a conclusion or recommendation related to the length of time that an intervention should be in order to be most beneficial to target parents and children.

Many of the studies did not have generalization measures or maintenance measures. Without knowing how newly gained skills are able to be generalized to other environments or maintained after an intervention has ceased, it can be difficult to truly know if the intervention being studied is effective. In addition to this, less than 80% of the studies indicated that social validity was confirmed (73.1%; $n = 122$ participants). Social validity, or the belief by participants that the intervention was useful and achieved the purpose it was designed to achieve, is an important aspect of research.

Some of the studies investigated utilized a formal, published parent training program and some of the studies utilized a training program that had been simply developed and designed with the specific study in mind. This makes it difficult to truly compare the studies and the

results because a structured curriculum might result in different outcomes for both the parents as far as accurate acquisition of techniques and for the child participants as far as changes in communication skills.

As stated previously, a majority of the participants in the 47 studies reviewed had a diagnosis of autism (64.2%). It is possible that the nature of this diagnosis could affect this review – if studies were conducted and able to be analyzed including children presenting with a wider variety of diagnoses it would likely result in different findings.

Implications for Future Research

The inclusion of studies with designs other than single case could provide additional useful information in the effects of parent-professional dyads and parent-professional-child triads on communication development in children with disorders related to communication.

Additionally, a review of the literature in the area of parent-professional dyads and parent-professional-child triads on other developmental domains in children (including cognition, motor skills, social-emotional skills, math skills, reading skills, and/or self-help skills) could provide information that would be valuable to fields related to child development.

While there is a body of research available regarding parent-teacher dyads and parent-professional-child triads with some disabilities/diagnoses, there is limited research related to others. Specifically, related to the population of individuals with hearing loss, there is limited research in the area of parent-implemented communication-based intervention specifically for children in the deaf/hard of hearing (D/HH) population. In this literature review, only two of the 165 total participants presented with any degree of hearing loss. Therefore, this is a suggested area for future research. Investigating strategies that promote increased language skill development in specific populations of children could be useful. We know that there are many factors that may affect a child's language development and we know that hearing loss can have a

significant impact on an individual's ability to gain and use language. Exploring parent coaching and parent implemented intervention techniques with this population should be investigated.

Another suggested research topic is a study comparing outcomes of skills taught to a child by a parent (who was coached by a professional, therefore a parent-professional dyad) versus outcomes of skills taught to a child by a parent and a professional (through a parent-professional-child dyad). Kaiser and Roberts (2013) conducted a group study looking at communication skills taught by (a) a therapist to one group and by (b) a therapist and a parent. Results of this study indicated that there are benefits including increased language skill outcomes in children as a result of teaching parents/caregivers therapeutic techniques to enhance language development in their children.

Related to having parents play an active role in their child's intervention, research in the area of the most effective adult-teaching modalities and strategies would provide salient information. Research has shown that while pediatric therapists and teachers are skilled in effective teaching strategies related to children, it is more challenging for them to know effective strategies that work well with adult learners. In order to coach and teach parents to be interventionists, the professionals teaching the parents should be equipped with effective strategies. Therefore, topics related to facilitating adult learning by pediatric professionals/therapists should be explored (Woods et al., 2011).

Lastly, there are relatively few studies that examine both the process and the outcomes related to parent-implemented communication interventions (Brown & Woods, 2016). The field could benefit from clear, research-based information regarding processes for setting up parent-implemented communication intervention systems. The present review of the literature revealed that there were not consistent methods of parent training or implementation of the intervention

systems amongst the studies. Information related to best practices could result in better informed professionals who are able to set up more effective parent training programs related to preparing parents to being effective communicators and interventionists within therapeutic dyads or triads.

Chapter Summary

While it may be complex to plan, parent-implemented intervention for children with communication delays can result in positive outcomes related to increased communication (including speech and/or language) skills in young children (Akamoglu & Dinnebeil, 2017; Chen et al., 2007; Roberts & Kaiser, 2011). Parents are most often with their children far more hours throughout the week than therapists or teachers are, giving them many more opportunities to affect change in their children. Taking advantage of this by helping parents become partners in the intervention process can be a valuable experience for all involved. Considerations related to specific training programs and/or focus on skill development, service delivery location, and duration/length of parent training should be made by professionals who intend to use parent-implemented intervention as a therapeutic tool. Further research is suggested to investigate specific characteristics of parent training programs to determine what skills being taught could have the best impact on parents' ability to affect change in their children's communication skill development.

Table 6*Literature Review Search Terms*

Parents	Communication	Disability
Parent	Communication	Disabilities
Mother	Language	Special needs
Father	Writing	Language disorder
Guardian	Written language	Autism
Caregiver	Literacy	Deafblindness
	Speech	Blindness
	Emergent communication	Deafness
	Nonsymbolic communication	Developmental delay
	Presymbolic communication	Emotional disturbance
	Emergent symbolic communication	Hearing impairment
	Vocabulary	Intellectual disability
	Intentional communication	Multiple disabilities
	VOCA	Orthopedic impairment
	Symbols	Other health impairment
	Speech generating devices	Specific learning disability
	SGD	Speech or language impairment
	Voice output communication aid	Traumatic brain injury
	Alternative Communication	Visual impairment
	Augmentative Communication	
	AAC	
	Augmentative and alternative communication	

Note. Search terms used for the literature review included a comprehensive list of terms related to parents, communication, and disabilities.

Table 7*Summary of Findings*

Author(s)	Child Participants	Dyad or Triad Intervention	Communication Skill Outcomes	Generalization	Maintenance	Social Validity
Barker, A. F. (2016)	3	Triad	Increased receptive and expressive communication	Positive effect	Positive effect	Confirmed
Binger, C., Kent-Walsh, J., Berens, J., Del Campo, S., & Rivera, D. (2009)	3	Dyad	Increased multi-symbol productions	Positive effect	Positive effect	Confirmed
Broome, J. L. (2007)	1	Triad	Increased all skills above baseline	Not measured	Not measured	Confirmed
Brown, J. A. & Woods, J. J. (2015)	9	Triad	Increased expressive skills	Not measured	No	Confirmed
Bucio, M. O. (2016)	3	Dyad	Increased on topic queries	Not measured	Positive effect	Confirmed
Caffero, J. M. (1995)	5	Dyad	Increased skills	Not measured	Not measured	Not measured
Cermak, S. M. (2011)	1	Dyad	Increased requesting and attending	Not measured	Positive effect	Not measured

(Table Continues)

(Table Continued)

Author(s)	Child Participants	Dyad or Triad Intervention	Communication Skill Outcomes	Generalization	Maintenance	Social Validity
Chaabane, D. B. B., Alber-Morgan, S. R., & DeBar, R. M. (2009)	2	Dyad	Increased skills	Positive effect	Not measured	Confirmed
Charlop-Christy, M., & Carpenter, M. H. (2000)	3	Dyad	Increased direction following and vocab	Not measured	Positive effect	Confirmed
Chen, L. (2015)	3	Triad	Increased skills	Not measured	Positive effect	Confirmed
Christiansen, S. (2010)	2	Dyad	Increased verbal output	Not measured	Not measured	Not measured
Christiansen-Smith, S. (2014)	4	Triad	Increased expressive skills	Not measured	Not measured	Confirmed
Daczewitz, M. E. (2015)	1	Dyad	Increased expressive skills	Not measured	Positive effect	Confirmed
Ence, W. A. (2012)	3	Dyad	Increased expressive skills	Positive effect	Positive effect	Confirmed
Foster-Sanda, S. M. (2014)	5	Dyad	Increased play and commenting	Not measured	Not measured	Not measured
Gerow, S. L. (2017)	3	Dyad	Increased skills	Positive effect	Not measured	Confirmed

(Table Continues)

(Table Continued)

Author(s)	Child Participants	Dyad or Triad Intervention	Communication Skill Outcomes	Generalization	Maintenance	Social Validity
Hansen, B., & Shillingsburg, M. A. (2016)	2	Dyad	Increased vocalizations	Not measured	Not measured	Confirmed
Hemmeter, M. L., & Kaiser, A. P. (1994)	4	Triad	Increased skills	Positive effect	Not measured	Confirmed
Higgins, W. J. (2013)	3	Dyad	Increased expressive skills	Positive effect	Positive effect	Confirmed
Hunt, N. M. (2015)	2	Triad	Increased social engagement	Not measured	Positive effect	Not measured
Ingvarsson, E. T. (2011)	1	Dyad	Increased requesting	Not measured	Not measured	Not measured
Kaiser, A. P., Hancock, T. B., & Nietfeld, J. P. (2000)	6	Dyad	Increased skills	Positive effect	Positive effect	Confirmed
Kashinath, S. P., Woods, J., & Goldstein, H. (2006)	5	Dyad	Increased skills	Positive effect	Not measured	Confirmed
Kent-Walsh, J., Binger, C., & Hashem, Z. (2010)	6	Triad	Increased communicative turns	Positive effect	Positive effect	Confirmed
Keough, B. A. (2016)	3	Dyad	Increased social communication	Not measured	Not measured	Confirmed
Keyes, S. L. (2012)	1	Dyad	Increased skills	Not measured	Positive effect	Confirmed

(Table Continues)

(Table Continued)

Author(s)	Child Participants	Dyad or Triad Intervention	Communication Skill Outcomes	Generalization	Maintenance	Social Validity
Koegel, R. L., Symon, J. B., & Kern Koegel, L. (2002)	5	Dyad	Increased skills	Positive effect	Positive effect	Not measured
Lafasakis, M., & Sturmey, P. (2007)	3	Dyad	Increased skills	Positive effect	Not measured	Not measured
Ma, C. Q. (2009)	3	Dyad	Increased joint attention and pointing	Positive effect	Positive effect	Not measured
Mancil, G. R., Conroy, M. A., & Haydon, T. F. (2009)	3	Triad	Increased skills	Positive effect	Positive effect	Confirmed
Masse, J. J. (2009)	3	Dyad	Increased imitation	Positive effect	Positive effect	Confirmed
McCollum, J. (1984)	3	Dyad	Increased skills	Positive effect	Not measured	Not measured
McDuffie et al. (2016)	6	Dyad	Increased skills	Not measured	Positive effects	Confirmed
Meadan, H., Angell, M. E., Stoner, J. B., Daczewitz, M. E. (2014)	5	Dyad	Increased skills	Not measured	Positive effect	Confirmed
Millard, S. K., Nicholas, A., & Cook, F. M. (2008).	6	Dyad	Increased fluency	Not measured	Positive effect	Not measured

(Table Continues)

(Table Continued)

Author(s)	Child Participants	Dyad or Triad Intervention	Communication Skill Outcomes	Generalization	Maintenance	Social Validity
Nunes, D., & Hanline, M. F. (2007)	1	Dyad	Increased skills	Positive effect	Not measured	Not measured
Parker-McGowan, Q. (2017)	3	Dyad	Increased skills	Positive effect	Mixed effects	Confirmed
Raegon, K. A., & Higbee, T. S. (2009)	3	Dyad	Increased commenting and play	Not measured	Positive effect	Not measured
Randolph, J. K., Stichter, J. P., Schmidt, C. T., & O'Connor, K. V. (2011)	3	Triad	Increased skills	Not measured	Positive effect	Confirmed
Roberts, M. Y., Kaiser, A. P., Wolfe, C. E., Bryant, J. D., & Spidalieri, A. M. (2014)	4	Triad	Increased skills	Positive effect	Positive effect	Not measured
Russell, C. (2014)	3	Dyad	Increased skills	Not measured	Positive effects	Confirmed
Schertz, R. A. (2006)	3	Dyad	Increased social communication	Positive effect	Positive effect	Confirmed
Vismara, L. A., Young, G. S., & Rogers, S. J. (2012)	9	Dyad	Increased skills	Not measured	Positive effect	Confirmed

(Table Continues)

(Table Continued)

Author(s)	Child Participants	Dyad or Triad Intervention	Communication Skill Outcomes	Generalization	Maintenance	Social Validity
Vismara, L. A., Young, G. S., & Rogers, S. J. (2012)	9	Dyad	Increased skills	Not measured	Positive effect	Confirmed
Winter, J. M. (2005)	6	Triad	Increased skills	Positive effect	Not measured	Confirmed
Yeh, C. (1994)	3	Dyad	Increased skills	Positive effect	Positive effect	Confirmed
Zaghlawan, H. (2011)	2	Dyad	Increased imitation	Positive effect	Positive effect	Confirmed
Zimmer, K. (2013)	4	Dyad	Increased skills	Positive effect	Positive effect	Confirmed

Note. Summarized results of included studies.

Table 8*Select Child Participant Characteristics*

Characteristic	Percentage
School Level	
Not enrolled	33.3% (<i>n</i> = 56)
Not reported	32.1% (<i>n</i> = 53)
Preschool	23.0% (<i>n</i> = 38)
Elementary School	11.5% (<i>n</i> = 19)
Diagnosis	
Autism	64.2% (<i>n</i> = 106)
Speech or Language Impairment	21.2% (<i>n</i> = 32)
Intellectual disability/DD	16.9% (<i>n</i> = 28)
Other Health Impairment	1.8% (<i>n</i> = 3)
Not Reported	1.8% (<i>n</i> = 3)
Other	1.2% (<i>n</i> = 2)
Multiple Disabilities	0.6% (<i>n</i> = 1)
Deafness	0.6% (<i>n</i> = 1)
Hearing Loss	0.6% (<i>n</i> = 1)
Traumatic Brain Injury	0.6% (<i>n</i> = 1)
Orthopedic Impairment	0.6% (<i>n</i> = 1)
Pre-Intervention Communication Level	
Emerging	35.8% (<i>n</i> = 59)
Multiword	24.2% (<i>n</i> = 40)
Prelinguistic	21.2% (<i>n</i> = 35)
Not reported	18.8% (<i>n</i> = 31)
Pre-Intervention Communication Mode	
Speech	63.6% (<i>n</i> = 107)
Gestures/Vocalizations	26.7% (<i>n</i> = 44)
Not reported	18.2% (<i>n</i> = 30)
Challenging Behavior	13.3% (<i>n</i> = 22)
AAC	7.9% (<i>n</i> = 13)
Sign Language	4.8% (<i>n</i> = 8)

Note. IDEA diagnosis categories were utilized for the purposes of this study; Pre-Treatment Communication Levels used definitions utilized by Snell et al. (2010): Emerging = single words, Multiword = non-rote connected speech consisting of two or more words in any mode, Prelinguistic = no real words in any mode; Pre-Treatment Communication Modes used categories reported by Snell et al. (2010).

Table 9*Select Parent Participant Characteristics*

Characteristic	Percentage
Educational Level	
Not Reported	30.3% (<i>n</i> = 50)
Four-Year College Degree	27.8% (<i>n</i> = 46)
High School Degree	20.6% (<i>n</i> = 34)
Graduate Degree	10.3% (<i>n</i> = 17)
Some College	9.1% (<i>n</i> = 15)
No Degree	4.8% (<i>n</i> = 8)
Two-Year College Degree	4.2% (<i>n</i> = 7)
Employment	
Not Reported	53.3% (<i>n</i> = 88)
Not Employed	32.7% (<i>n</i> = 54)
Employed	21.2% (<i>n</i> = 35)
Prior Training in Language Interventions	
Not Reported	72.7% (<i>n</i> = 120)
No	27.2% (<i>n</i> = 45)
Yes	7.2% (<i>n</i> = 12)

Note. Reported characteristics of parent participants

Table 10*Select Intervention Characteristics*

Characteristic	Percentage
Dyad or Triad	
Parent-Professional Dyad	80.6% (<i>n</i> = 133)
Parent-Professional-Child Triad	19.4% (<i>n</i> = 32)
Intervention Components	
Specific Program	85.5% (<i>n</i> = 141)
Prompting/Milieu Teaching	63.0% (<i>n</i> = 104)
Responsive Interactions	61.8% (<i>n</i> = 102)
Modeling	57.0% (<i>n</i> = 94)
Setting of Intervention	
Home	70.0% (<i>n</i> = 115)
Clinic	14.5% (<i>n</i> = 24)
Both Home and Clinic	14.5% (<i>n</i> = 24)
Other	3.0% (<i>n</i> = 5)
Not Reported	0.6% (<i>n</i> = 1)
Context of Intervention	
Natural	63.6% (<i>n</i> = 105)
Both Natural and Contrived	23.6% (<i>n</i> = 39)
Contrived	12.1% (<i>n</i> = 20)
Instructional Arrangement	
One-on-one	95.8% (<i>n</i> = 158)
Small Group	4.2% (<i>n</i> = 7)

Note. Some studies included more than one intervention component, which is why the total is higher than 100%.

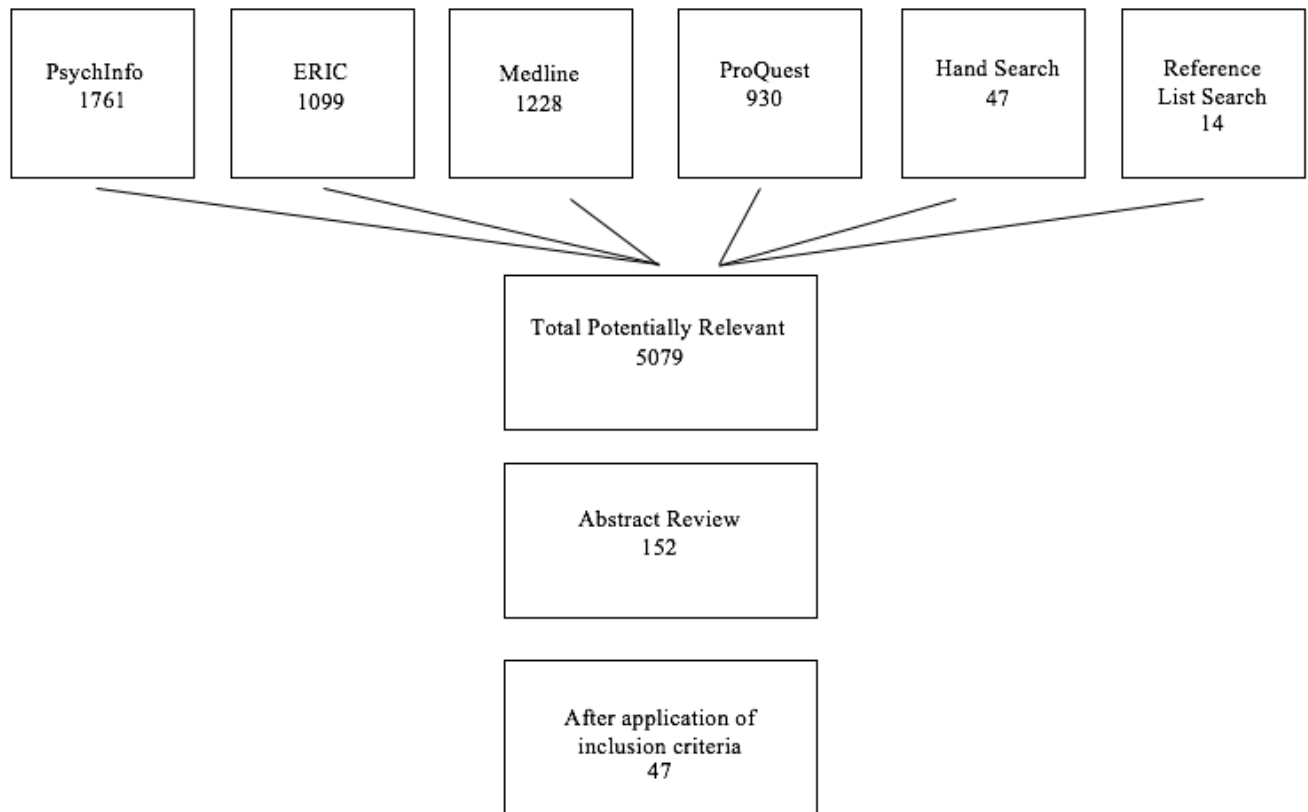
Table 11*Study Quality Indicators*

Component	Percentage
Participants Described Adequately	81.2% (<i>n</i> = 134)
Setting Described Adequately	97.9% (<i>n</i> = 46)
Intervention Agents Described Adequately	100% (<i>n</i> = 165)
Research Design Utilized	
Multiple baseline/multiple probe	97.6% (<i>n</i> = 161)
Alternating Treatment	2.4% (<i>n</i> = 4)
Intervention Outcomes Measured	
Expressive Communication	93.3% (<i>n</i> = 154)
Pragmatic/Social Communication	25.5% (<i>n</i> = 42)
Receptive Communication	6.7% (<i>n</i> = 11)
Speech Production	3.6% (<i>n</i> = 6)
Implementation Fidelity	
Treatment Fidelity	48.5% (<i>n</i> = 80)
Procedural Fidelity	38.1% (<i>n</i> = 63)
Not Reported	13.3% (<i>n</i> = 22)
Dependent Measure Reliability	
Measured – Acceptable	92.1% (<i>n</i> = 152)
Measured – Not Acceptable	4.2% (<i>n</i> = 7)
Not Measured	3.6% (<i>n</i> = 5)
Measured – Could Not Determine	3.0% (<i>n</i> = 5)
Generalization Measure	
Measured – Positive Effects	51.5% (<i>n</i> = 85)
Not Measured	50.3% (<i>n</i> = 83)
Measured – No Positive Effects	3.6% (<i>n</i> = 6)
Maintenance Measure	
Measured – Positive Effects	70.3% (<i>n</i> = 116)
Not Measured	27.9% (<i>n</i> = 46)
Measured – No Positive Effects	3.0% (<i>n</i> = 5)
Social Validity Measure	
Confirmed Social Validity	73.9% (<i>n</i> = 122)
Not Measured	26.0% (<i>n</i> = 43)
Did Not Confirm Social Validity	0.06% (<i>n</i> = 1)

Note. Some studies had more than one dependent measure/intervention outcome.

Figure 4

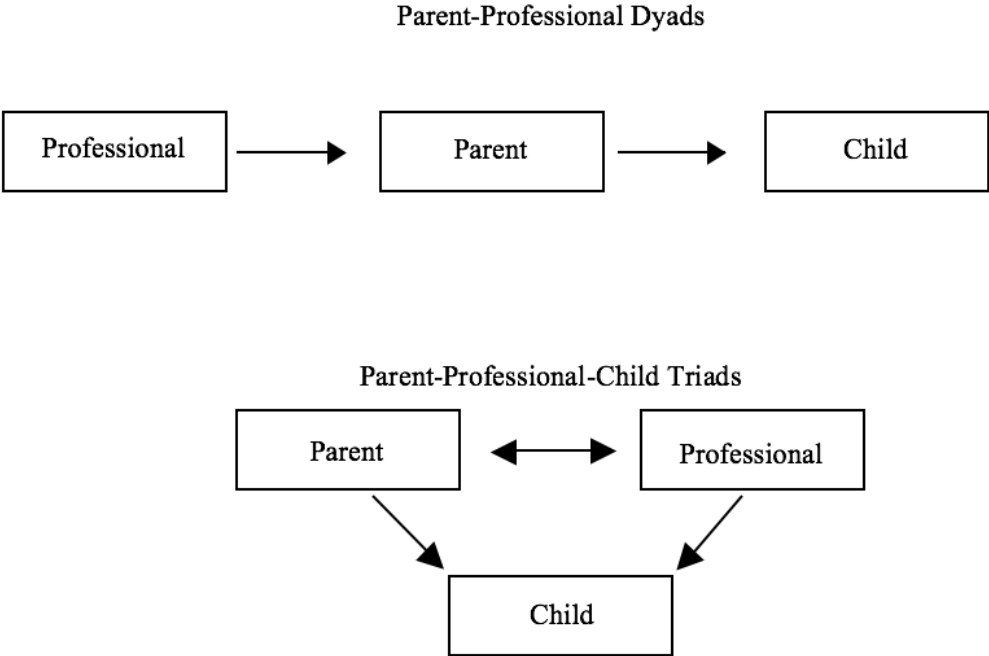
Article selection process



Note. 47 articles were found to be relevant for the literature review after application of inclusion criteria.

Figure 5

Parent-Professional Dyads and Parent-Professional-Child Triads.



Note. Parent-professional dyads and parent-professional-child triads are both described in the literature related to parent/caregiver coaching.

CHAPTER III: METHODOLOGY

The methods used for this study are described within this chapter. First, a problem statement and description of study design are discussed. Next, the purpose of the study is stated. Research questions, study design, participant descriptions, and participant selection procedures are outlined. Later, the study setting, materials, data collection process, study procedures, and data analysis is explained. Lastly, the social validity measure that was given to parent/caregiver participants prior to and following participation to investigate parental/caregiver perspectives is described.

Problem Statement

My study investigated the ability of primary caregivers to use naturalistic strategies to support communication development in children with hearing loss within their home environments. I, as a speech-language pathologist (SLP) and the interventionist, provided a detailed intervention plan to the primary caregiver participants via Zoom, a video conferencing platform (Zoom, 2020). In this study, the term “primary caregivers” will be used to indicate parent, guardian, or caregiver participants. I chose video conferencing sessions, as opposed to face-to-face sessions, because my study followed the 2020/2021 Covid-19 pandemic, which increased the use of video modality in therapeutic service delivery. This training modality also addressed a gap in the literature existed related to the use of telehealth for delivering speech-language pathology intervention services to school-age children (Wales et al., 2017).

In particular, my study aims to add to the body of research in the area of best practices in teaching and coaching parents of young children who are deaf or hard of hearing to independently use language facilitation strategies within their own natural environments. Research within the field of Early Intervention has shown that a coaching model that involves

primary caregivers in the therapeutic process as a triad (i.e., the interventionist, parent, and child) results in positive child outcomes (Lieberman-Betz, 2015). In spite of this, research has also shown that providers across many different disciplines still reply primarily on direct interventions delivered only by therapists (Friedman et al., 2012) as opposed to involving primary caregivers in the therapeutic process.

The intent of the present study is to add to the overall body of research related to communication intervention service delivery for young children who are deaf or hard of hearing. Specifically, primary caregivers will be coached by SLPs to facilitate intervention with their own young children who are deaf or hard of hearing. I used a multiple-probe design to evaluate caregivers' ability to implement home-based communication intervention with children ages eighteen months to four years, eleven months old who are deaf or hard of hearing.

Purpose Statement

The purpose of this study is to investigate primary caregiver-implemented home-based communication interventions following training/coaching via video conferencing with an SLP.

Research Questions

This study was designed to answer the following research questions:

- 1) After receiving training, to what extent will primary caregivers of young children who are deaf or hard of hearing be able to implement home-based communication interventions with fidelity?
- 2) What is the social importance of the intervention as perceived by primary caregiver participants?

Research Design

I implemented a single-case experimental, multiple probe design study for each participating primary caregiver/child dyad. Training, delivered by the principal investigator (a pediatric, licensed SLP) to primary caregiver participants, began once stable baselines of primary caregiver behavior on target techniques was established. I chose a multiple probe design for this study because the research questions lend themselves to this type of design. An intervention study investigating the way that study participants respond to training is irreversible due to learning effects, which made this design appropriate for the present study.

Following the completion of baseline sessions, primary caregiver participants received training on five different communication-enhancing techniques/strategies via Zoom with the primary investigator. These techniques/strategies were written by professionals with expertise in working with families of children who are deaf or hard of hearing and are intended to be used by caregivers with their children within the home/natural environments during play and natural routines. For the purposes of this study, I taught these techniques/strategies to parents who incorporated them during play scenarios selected by primary caregivers based on each child participant's specific interests.

I selected the intervention strategies based on strategies detailed in the Sunshine Cottage School for Deaf Children's *STARR – Parent Coaching Strategies for Listening and Spoken Language* program: **Stay Close**; **Talk, Talk, Talk**; **Auditory Environment**; **Reciprocity**; and **Repeat Routines**. After baseline data were established, I taught these five strategies to the primary caregiver participants during a training session held via Zoom. Primary caregivers then recorded themselves interacting with their child using these target strategies for a period of two weeks following the initial training session. I provided a coaching session to primary caregiver

participants via zoom if a primary caregiver participant exhibited the use of target behaviors below 80%. I asked the caregivers to continue recording themselves as maintenance probes. Additionally, caregivers submitted videos showing generalization probes during different natural activities/family routines.

I created social validity surveys to gather additional information from primary caregiver participants. Before the study began, I sent caregivers an initial social validity survey to gather their perspectives on caregiver-implemented communication instruction. Following the conclusion of the study, I sent a second social validity survey to gather information regarding their experience with and the impacts of the study.

Threats to Internal Validity

Common threats to internal validity in single-case design research (Gast & Ledford, 2018) were taken into consideration and were minimized by the following attempts.

- 1) History: To control for history, caregiver participants had no previous experience with a formal training program in the area of communication skill facilitation.
- 2) Maturation: To control for maturation, the entire study was no longer than eight weeks in length.
- 3) Testing: A variety of different activities were used during the study so that neither caregivers nor children became “used to” one particular routine or activity.
- 4) Instrumentation: Inter-observer agreement (IOA) for data reliability was obtained at 80% or higher for 20% of all conditions (baseline, intervention, maintenance, and generalization phases) for each caregiver participant. I collected data from each of the recorded sessions, and a secondary investigator collected data from 20% of the total number of recorded sessions. Discussion of IOA will occur in chapter IV.

5) Procedural fidelity: In order to control for procedural fidelity, each primary caregiver participant and the secondary investigator was trained by the primary researcher regarding the procedures of the study using a checklist (see Appendix D).

6) Attrition: The goal of three or four primary caregiver and child participant dyads was established during study development to control for possible attrition (potential withdrawal from the study for any reason). While the present study ultimately only had two primary caregiver and child participant dyads complete the study, neither dyad withdrew from the study after beginning the study.

7) Multiple treatment interference: I requested that the participants not participate in any other primary caregiver training programs during participation in this study. Both primary caregiver participants reported that they did not participate in any other primary-caregiver training programs during their participation in this study.

8) Cyclical variability: I asked primary caregivers to vary the time of day and day of the week during which recording sessions took place in order to control for cyclical variability.

Additionally, the play schemes/interactions that the families recorded varied somewhat from session to session. While caregivers were given kits of toys to use within sessions, the ways that they used the items could vary based on child interest.

9) Adaptation: The routines used in this study were the same as or very similar to routines already in place in each family's life. Toys that were provided to families to use during the study were chosen based on each child's specific interests. Additionally, recording sessions took place between simply a primary caregiver and child who are naturally already familiar with one another as family members. Sessions took place within the family's home which would naturally be comfortable for both the primary caregiver and the child.

External Validity Across Participants

The ability to generalize the strategies used within this study provides external validity. The strategies taught and targeted are part of a published program, The S.T.A.R.R. program by Sunshine Cottage School for Deaf Children (2017), which is available via the publisher's website and could be accessed by anyone interested in learning or utilizing these strategies.

Participant Selection and Preparation

The primary investigator distributed Qualtrics surveys to solicit interest from families of children who were deaf/hard of hearing via social media groups for parents of young children with communication delays. I asked interested primary caregivers to complete a brief Qualtrics survey to confirm inclusion criteria were met. Following receipt of survey responses, I reached out to each potential primary caregiver participant via email to set up a time for an initial interview held via Zoom. Initially, five potential participants completed the Qualtrics survey. However, only three potential participants provided contact information and only two potential participants followed through with scheduling an initial Zoom interview with the primary investigator. I scheduled individual Zoom sessions with each of the two potential participants.

Participants

Two caregiver-child dyads participated in this study. Inclusion criteria for children included: (a) having any degree of hearing loss, (b) 18 months through five years of age, and (c) having a diagnosed or suspected language delay. Inclusion criteria for caregivers included being a primary caregiver (e.g., parent, legal guardian, etc.) of a child who met the above criteria. It was assumed that all primary caregivers who responded to the initial participation were interested in learning and implementing home-based communication facilitation techniques. Furthermore, potential primary caregiver participants expressed commitment to completion of training activities.

A dyad will be excluded if (a) the child did not receive a formal diagnosis of hearing loss, (b) the child was older than four years, 11 months of age, (c) the caregiver did not have concerns related to communication skills, or (d) the caregiver was not interested in learning and implementing communication facilitation techniques. I established pseudonyms for both child and primary caregiver participants to ensure confidentiality.

Child Participants

Prior to the training, I gathered the following child demographic information from their caregiver: age, type and degree of hearing loss, type of amplification (if applicable), age at amplification (if applicable), communication modality utilized, participation in therapeutic services (e.g., speech/language therapy, developmental therapy, etc.), and medical diagnoses (if applicable). For each child participant, one primary caregiver was recruited to participate in the study.

Caleb. At the time of the study, Caleb was nineteen months old. Caleb is a male, Caucasian child who resides with his family: his father, mother, and an older three-year-old sister. Caleb has unilateral deafness and no cochlea on his left side. He presents with hearing that is within normal limits on his right side. Caleb does not use amplification. Caleb participates in weekly speech/language therapy for 60 minutes per session through an early intervention program and early childhood sign language classes once per week for 60 minutes. Caleb's family primarily uses spoken language to communicate at home and augments some of their communication with early-developing sign vocabulary. Caleb has no additional medical diagnoses other than his unilateral deafness.

Clayton. At the time of this study, Clayton was four years, six months of age. Clayton's mother chose not to report race or ethnicity information for her son. Clayton lives at home with his family: his father, his mother, and a younger two-year-old brother. Clayton presents with a

bilateral mild hearing loss and uses no amplification. He has a history of participating in speech/language therapy as well as in early childhood sign language classes, however he was not participating in these services during the time of the study. Clayton's family uses spoken language to communicate at home. Clayton has no related medical diagnoses other than his mild hearing loss.

Primary Caregiver Participants

For primary caregiver participants, I gathered the following demographic information: age, occupation, level of education completed, ethnicity, and their experience with previous parent training/interventions. Primary caregivers had the option to not respond to demographic information if they did not feel comfortable doing so.

Matthew. The father of Caleb, Matthew, is between 30-40 years of age. He is a white/Caucasian male who has a bachelor's degree and works as a sales representative. Prior to participation in this study, he had not participated in any parent training related to communication facilitation.

Grace. Grace, the mother of Clayton, is between 30-40 years of age. She has a master's degree and chose not to disclose her ethnicity or occupation. Prior to participation in this study, she had not participated in any parent training related to communication facilitation.

Materials

Primary caregiver participants each had access to a device with internet access such as a computer or tablet with the Zoom video conferencing platform installed. If primary caregiver participants did not own or have access to such a device, the primary investigator would have located one to loan to the family. After the first initial meeting with the primary caregiver, the principal investigator created kits for each family to use during intervention sessions based on

their child's interests. Caleb received a kit that included a variety of vehicles and related accessories. Clayton received a kit that included a variety of building-related toys. During generalization sessions, primary caregiver participants used different toys found within their homes.

For caregiver trainings through Zoom meetings, I used a variety of materials including typed PowerPoint presentations and videos. In addition, I recorded short video demonstrations reviewing techniques for the primary caregiver participants to view in their homes via following the in-person training to provide additional support.

Setting

Each of the primary caregivers' initial visit, training sessions, baseline, and intervention sessions took place within individual families' home via video conferencing using Zoom with the primary investigator, a licensed pediatric SLP.

Independent Variable

Intervention, the independent variable in this study, was caregiver training and coaching on five different communication facilitation techniques. The five techniques taught are: (a) *Stay Close*, (b) *Talk, Talk, Talk*, (c) *Auditory Environment*, (d) *Reciprocity*, and *I Repeat Routines*. While all five techniques were taught to participants, specific data was only recorded on techniques (b) *Talk, Talk, Talk* and (d) *Reciprocity*. Operational definitions on these five principals, based on how the techniques are described in the S.T.A.R.R. manual (Sunshine Cottage School for Deaf Children, 2017), are summarized below.

Communication Facilitation Technique 1: Stay Close

The strategy of "staying close" refers to physically remaining within 3 feet of the child and his/her hearing technology. Primary caregiver participants were trained to position themselves next to their child, no matter where he/she went/moved. During training, I explained

that items presented to the child must be at the same level as the child's body, and gave examples of seating tools (e.g., highchairs, booster seats, step stools, cushions, etc.).

Communication Facilitation Technique 2: Talk, Talk, Talk

During targeting of the *Talk, Talk, Talk* strategy, I instructed primary caregivers to increase the quantity of parental language input and to ultimately provide a consistently language-rich environment for their child. A child should hear 20,000 words or more per day as an ultimate goal. The S.T.A.R.R. manual uses 20,000 or more words per day as the rubric for determining if an environment can be described as language rich. Teaching parents/caregivers that talking/conversation can happen within each of the child's daily routines and activities was a key part of this strategy. With explicit models, I discussed strategies such as reading, singing, narrating play schemes, imitating the child, and attaching language to various family routines. I also shared with caregivers the fact that research indicates that simply being exposed to and hearing a high number of words is correlated with higher language output outcomes (Leffel & Suskind, 2013). I stressed to primary caregiver participants to provide as much language input to their child as possible through daily interactions.

Communication Facilitation Technique 3: Provide an Ideal Auditory Environment

Auditory environment refers to the area where the observations and training take place and includes factors that affect the child's ability to clearly access auditory information coming from the caregiver. Background noise and other auditory distractions, for example, have a negative effect on an auditory environment. During the training, caregiver participants were shown how to make changes to the auditory environment if necessary. I requested that caregiver participants do their best to provide an ideal auditory environment for children with hearing loss including: ensuring hearing technology (if used) is on and functional during all waking hours,

identifying (and avoiding when necessary) noisy areas within the home, eliminating background noise within the environment being utilized during interactions with the child, sitting on/talking on the side of the child's best hearing ear, and positioning the parent/caregiver close to and at the same level as the child.

Communication Facilitation Technique 4: Reciprocity

Reciprocity, for the purposes of this study, refers to caregivers responding to each of the child's verbal and nonverbal initiations and responses to create mutual, two-sided communication. Examples of verbal initiations from a child may include using a word or word approximation to comment or make a request. Examples of non-verbal child initiations include looking at an item of interest, gesturing, and/or making a noise or sound. I taught primary caregiver participants the importance of responding to each of their child's communicative attempts, using both verbal and non-verbal communication. I specifically modeled turn-taking, rewarding communicative attempts, and positive facial expressions and body language. Examples include caregivers making frequent eye contact with the child, showing interest in what the child is interested in by using positive body language and comments, and verbally narrating what the child is doing. According to the S.T.A.R.R. manual, a response should occur within three seconds of a child's communicative effort in order to be considered occurring with reciprocity.

Communication Facilitation Technique 5: Repeat Routines

The *Repeat Routines* technique requires parents to build communication in basic daily routines (feeding, changing diapers, bathing, etc.). I discussed adding beneficial routines that could easily fit into a particular family's lifestyle (e.g., shared books, feeding a pet, etc.).

Dependent Variables

Note that while I trained the primary caregiver participants on all five strategies described in the S.T.A.R.R. manual, I only collected data on two techniques. Therefore, two primary caregiver behaviors are the dependent variables in this study: use of *Talk, Talk, Talk*, and *Reciprocity*. *Reciprocity* was chosen as the primary dependent variable that was used when determining when a participant was ready to move out of baseline. Implementation fidelity of these two behaviors was defined as exhibiting increased/purposeful use of these skills when compared to baseline.

Primary caregiver behavior for the target skill of *Talk, Talk, Talk* was recorded by a count of the total number of words the primary caregiver produced within the target five-minute interval. Primary caregiver behavior for the target skill of *Reciprocity* was recorded using event recording by tallying the presence of primary caregiver responses to child communicative efforts and the total number of child communicative efforts and dividing the presence of primary caregiver responses by the total number of child communicative efforts.

From each recording, I collected data on the primary caregiver participants' use of this strategy by recording the number of child communicative efforts (both verbal and non-verbal) and the number of primary caregiver responses within three seconds of a child's effort. Then, I took the total number of primary caregiver responses within three seconds and divided that number by the total number of child communicative efforts, resulting in a percentage. For example, if a child exhibited 40 communicative efforts and a caregiver responded with reciprocity to 25 of those efforts during one five-minute session, the percentage of reciprocity would be 62.5%.

Data Collectors

I served as the primary investigator and interventionist in this study. I am a doctoral candidate in a special education program at a midwestern university. I have a master's degree in Speech-Language Pathology and a credential as a provider and evaluator within my state's Early Intervention (EI) system. I have fifteen years of experience working with individuals with pediatric speech and language disorders. A secondary data collector viewed and analyzed 20% of recorded caregiver intervention sessions in order to calculate interobserver reliability (IOA).

Additionally, this secondary investigator helped investigate the fidelity of implementation, including how the primary investigator trained the primary caregiver participants using a checklist to code the video-recorded sessions. The secondary investigator has an Ed.D. in special education, is a credentialed state EI provider, and worked as a clinical faculty in a special education program at a midwestern university.

Procedures

Primary caregiver participants participated in pre-baseline, baseline, training/intervention, maintenance, and generalization phases. In addition, they completed pre- and post- participation surveys to answer the second research question and to gather social validity information.

Pre-Baseline

During the initial Zoom screening interviews, I discussed participation in the study, ensured inclusion criteria were met, and assessed the primary caregiver participant's ability to use Zoom effectively. I provided primary caregivers information about the study, including the knowledge that this study included parent/caregiver training on naturalistic communication facilitation techniques that are commonly used by professionals (e.g., SLPs and teachers of the Deaf) working with young children who are deaf or hard of hearing. I also gathered information related to specific interests of their child to assist with training planning . I sent each

caregiver/child dyad a kit of toys that would be used during training and caregiver/child interactions.

Baseline

Once parents received the kit of toys, I provided information on how to collect baseline data to the primary caregiver participants. Primary caregiver participants received unique, private meeting links for Zoom meetings through my university Zoom account. I asked participants to log on to the Zoom meeting link provided and record ten-minute natural play sessions with toys they received. Following completion of each session, recordings automatically were uploaded into a password-protected cloud account. I analyzed the first five minutes following the portion of the recording that included primary caregiver getting the recording started, getting the child situated, arranging the environment, etc. The first portion of the recording that included these preparatory activities was not analyzed due to it not containing purposeful interactions between the caregiver and child.

To gather baseline information regarding therapeutic techniques that primary caregivers may naturally use within their natural environments prior to their training, the primary investigator observed primary caregiver participants interacting with their child by viewing caregiver-created recordings of ten-minute natural in-home activities within the family's home using the aforementioned materials provided by the principal investigator. I asked participants to prepare these recordings at times convenient to them and to conduct these recorded interactions in a setting familiar to the child (e.g., the child's bedroom, playroom, living room, kitchen). Of the ten minutes recorded, the primary investigator observed and collected data from a five-minute portion, specifically on the *Talk, Talk, Talk* and *Reciprocity* techniques. Participants made ten-minute recordings to ensure that at least five minutes would show salient purposeful interactions between the primary caregiver and child. For example, I did not collect data during

the first minute while the caregiver started the recording and got the environment and the child situated due to this time not always including conversation or language use.

I observed and coded at least five different sessions for each caregiver/child dyad until data indicated stability for the *Reciprocity* technique. Specifically, I viewed recordings of primary caregiver/child interactions (created by primary caregivers) and coded for occurrences of any of two target language facilitation strategies that would be later taught during the intervention/primary caregiver training (*Talk, Talk, Talk* and *Reciprocity*) using the data collection forms found in Appendix A.

The data collected on the first target strategy (*Talk, Talk, Talk*) consisted of a count of the words uttered by the primary caregiver participant. The data collected on the second target strategy (*Reciprocity*) consisted of recording the number of child communicative efforts (both verbal and non-verbal) and the number of parent responses within three seconds of a child effort. Then, I took the total number of parent responses within three seconds and divided that number by the total number of child communicative efforts, resulting in a percentage. Intervention began with the first participant once it was clear that performance was stable for at least one of the two target behaviors (after 8-9 sessions).

In order for a participant to enter the intervention phase, at least five baseline data points needed to be collected through five recorded baseline sessions. Additionally, baseline sessions needed to show minimum variability and no evidence of a rising trend showing improvement. Baseline data were considered stable when three or more data points (parent behaviors) were consistent with one another. Consistency of primary caregiver behaviors was defined as a primary caregiver exhibiting a target behavior within 5% within three consecutive sessions. Intervention on communication facilitation strategies was intended to begin after at least five

baseline sessions were completed. The second caregiver received the training once stability in post-training behavior was exhibited by the first caregiver participant, which was after six sessions.

Primary Caregiver Training

Following the establishment of the baseline, I trained the first primary caregiver who exhibited stable baseline behavior. The training occurred via video conferencing and was provided on the five language facilitation strategies outlined in the S.T.A.R.R manual (see Table 12 for training procedures) via videoconferencing. During the hour-long training session, I taught the use of the target techniques to the primary caregiver participant via direct instruction and modeling, question and answer, and role playing. Information was presented both visually with videos of examples of specific strategies and typed PowerPoint slides (see Appendix C for the script of information contained in the PowerPoint training). Training also included practice identifying the target skills/strategies within videos, explicit teaching of the strategies, and reciprocal conversation about the strategies. The primary caregiver participants were also given opportunities to ask any questions related to the training/target strategies.

Following training sessions, I requested that primary caregivers record 10 minutes of themselves carrying out activities with their child within their home environment based on what they learned during training sessions. These videos were instructed to be 10 minutes in length, identical to the baseline sessions, and were recorded via private Zoom meeting links and uploaded to the primary investigator's password-protected university Zoom cloud account. These interactions took place within the family's home and included use of materials fitting the identified interests similar to baseline, using the same theme (e.g., vehicles, building) for each session. When the caregiver completed each 10-minute session, Zoom automatically uploaded a

recording to a password-protected university cloud storage. Data were collected regarding the use of the two target strategies. Primary caregiver participants did not have access to recordings of other participants. Only the research team (primary investigator and secondary investigator) have access to all participants' videos and data.

Table 12*Intervention Schedule*

Step	Stage	Session Description	Data Collection	Coaching
1	Baseline	A minimum of 5 sessions, continued until stability is reached	Parent use of any of <i>Talk, Talk, Talk</i> and <i>Reciprocity</i> – looking for stability	N/A
2	Intervention	Training session held with principal investigator and primary caregiver via Zoom, followed by the primary caregiver making recordings of interactions with their child for two weeks	Parent use of the two target strategies: <i>Talk, Talk, Talk</i> and <i>Reciprocity</i>	Coaching was provided if recordings showed less than 80% accuracy using target two target strategies
5	Maintenance	Three or more maintenance sessions recorded by parents of parent/child interactions following the end of intervention/coaching. Maintenance and generalization alternated back and forth during the same time period	Parent use of the two S.T.A.R.R. target strategies	Looked at the maintenance of ability to use target strategies in the absence of intervention/coaching sessions
6	Generalization	Three or more generalization sessions recorded by primary caregivers showing parent/child interactions in new unique situations. Maintenance and generalization alternated back and forth during the same time period	Parent use of the two S.T.A.R.R. target strategies	Looking for generalization of ability to use target strategies in the absence of intervention/coaching sessions

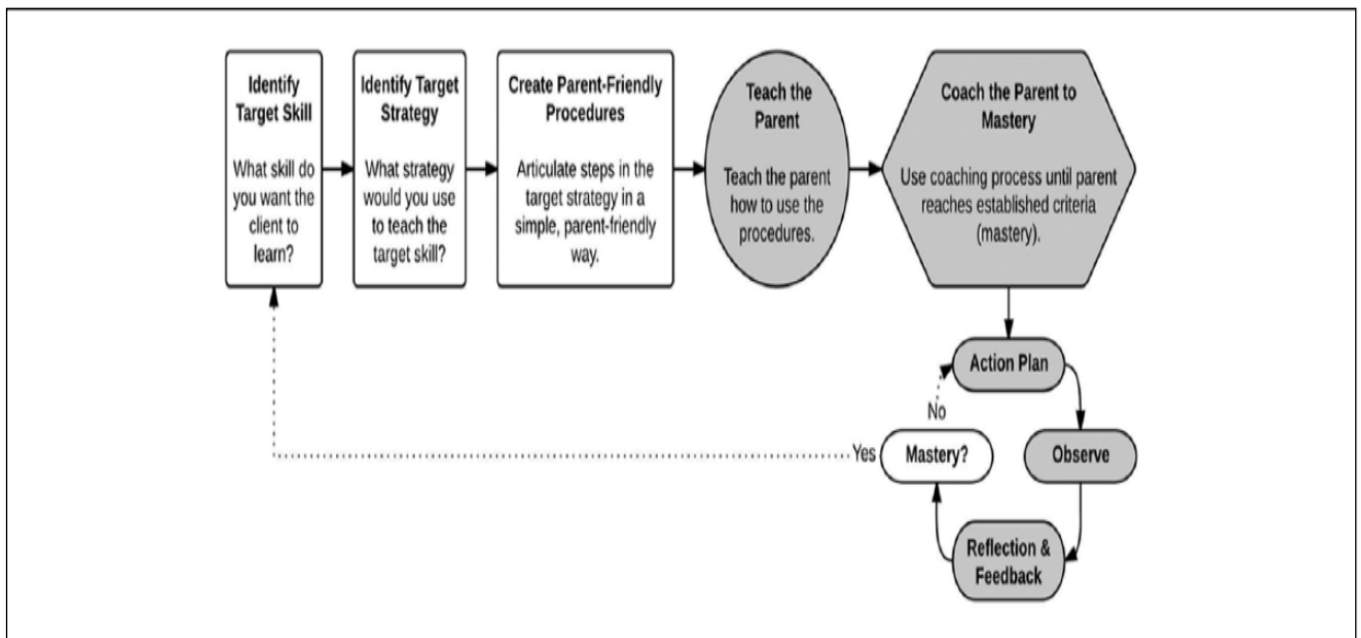
Note. Communication facilitation techniques adapted from “S.T.A.R.R. Parent Coaching Strategies for Listening and Spoken Language,” by the Sunshine Cottage School for Deaf Children, 2017

Coaching

If a caregiver did not achieve 80% in using the target technique of reciprocity, I planned a live sixty-minute-long coaching session with that caregiver. Coaching sessions included identifying the target skills, identifying target strategies, explicit teaching of the strategies, and a circular coaching process. I observed the primary caregiver carrying out target strategies while providing reflection and feedback. Then the caregiver and I developed an action plan and repeated steps of this circle as needed until the caregiver met mastery. Mastery was defined as showing reciprocity in 90% or more of opportunities during the coaching for participants who required coaching. The coaching model that was used is illustrated in Figure 6. See Appendix E for coaching procedures.

Figure 6

Coaching Methods



Note: Snodgrass, et al., 2017

Maintenance

Caregiver behaviors were recorded through data collection of recorded sessions for a period of two weeks following the initial training. Two weeks was chosen as the period of time to mirror the once per two weeks frequency of services often provided to families through Early Intervention services. Two weeks after the initial training session, primary caregiver participants recorded additional ten-minute interactions within their home environment using the same materials and themes used following the initial training.

Caregivers recorded maintenance sessions (in the absence of any additional training or coaching) on different days. I analyzed these recorded sessions to see if primary caregivers had the ability to maintain skills (the two target therapeutic techniques) without further training or coaching. I coded for the presence or absence of each of the two target behaviors for five minutes of each recorded session in the same way it was done for baseline and post-intervention sessions.

Generalization

In addition to maintenance sessions, primary caregiver participants recorded additional five-minute interactions within their home environment during new, novel activities/routines – pop-up books I provided to each family. Caregivers recorded generalization sessions on different days. I analyzed these recorded sessions to see if the primary caregiver participants had the ability to generalize skills (the two target therapeutic techniques) within new activities without explicit instruction. I coded for the presence or absence of each of the target behaviors for five minutes of each recorded session in the same way it was done for baseline and post-intervention sessions.

Secondary Observer Training

I viewed and collected/coded data on the recorded primary-caregiver implemented intervention sessions. In addition, a secondary coder collected data on a minimum of 20% of recorded sessions. I trained the secondary coder on coding techniques prior to participation. The training consisted of data collection using an example video. Both of us coded and compared the data. The secondary coder completed an additional example video independently while I coded the same section. Again, we compared the results for both *Talk, Talk, Talk* and *Reciprocity*. If the data resulted in less than 100% agreeability, I planned to train again using another example video. During the training process, the second coder and I initially had 90% agreeability. Therefore, we viewed the training video again side-by-side and worked through each item in order to achieve 100% agreeability. Both coders coming up with the same word count indicated 100% agreeability for *Talk, Talk, Talk*. Both coders coming up with identical percentages for *Reciprocity*, indicating 100% agreeability for that technique.

Interobserver Agreement

Interobserver agreement (IOA), the degree to which independent observers report the same observations of primary caregiver behaviors, was calculated to determine reliability of the collected data. I viewed each of the recorded sessions, coding for instances of use of the two target dependent variables. Following training as described above, the second coder then viewed minimum of 20% of the videos (randomly selected from each phase including baseline, intervention, maintenance, and generalization) created by the primary caregiver participants. For the first dependent variable, *Talk, Talk, Talk*, the percent of occurrence agreement and percent of non-occurrence agreement were calculated after total count agreement was used to calculate the percentage of total agreement (i.e., smaller count/larger count x100). For the second dependent

variable, *Reciprocity*, IOA was also calculated using total count agreement (i.e. smaller count/larger count x100). IOA results are reported in Chapter IV.

Procedural Reliability Procedures

The secondary coder and I both recorded information related to procedural reliability, including observing how I trained the primary caregiver participants during both training and coaching sessions via a checklist coding the video-recorded sessions. The goal was to have 100% reliability, indicating that identical information had been presented to all participants during training sessions. The checklist can be found in Appendix D.

Data Analysis

Data were analyzed to investigate the success with which primary caregivers were able to implement home-based communication interventions as taught/modeled via training administered via Zoom. Visual inspection and descriptive statistics of graphed data is reported and discussed in Chapter IV.

Social Validity

Primary caregiver participants completed pre- and post- training questionnaires/surveys via Qualtrics to share their perceptions of the practicality and usefulness of the training and coaching provided during this study. Questions were also asked regarding participants' perceptions of the goals and outcomes of the study. I utilized both Likert-type questions and open-ended questions in both of these surveys.

The pre-training survey included 13 Likert-type questions using rating scales and three open-ended questions. The pre-training questions regarding knowledge and perceptions about primary caregiver implemented intervention related to communication skills prior to completing the training. The post-training survey included 19 Likert-type questions using rating scales and

seven open-ended questions. Post-training surveys included questions regarding knowledge following completing the training, as well as perceived value in participation.

I analyzed responses by coding to compare themes both within participants and across participants. I used the data collected from responses to Likert-scale questions to report mean responses to each question. I analyzed, coded, and reported common themes in the qualitative data garnered from open-ended questions. Pre- and post- training questionnaires can be found within the Appendix F and Appendix G. Survey results and analysis can be found in Chapter IV.

Chapter Summary

I used a multiple-probe single subject design (SSD) method to investigate primary caregiver-implemented home-based communication interventions following training via video conferencing with an SLP. Two primary caregiver and child dyads participated in intervention taking place over the course of approximately eight weeks, including 8-9 baseline sessions, one training session followed by two weeks of caregiver-implemented intervention sessions, and two to three weeks of maintenance and generalization sessions. A formal training program published by the Sunshine Cottage School for Deaf Children was used as a framework for providing primary caregiver participants with information on five different therapeutic strategies to use to target increasing communication skills in their child. Caregiver use of two specific target strategies, *Talk, Talk, Talk* and *Reciprocity* were the dependent variables analyzed throughout this study. Lastly, I obtained information regarding social validity via survey questionnaires completed by primary caregiver participants both prior to and following completion of participation in the study. Results will be discussed in Chapter IV.

CHAPTER IV: RESULTS

I used a multiple-probe, single case design for this study to investigate primary caregivers' use of therapeutic strategies to support communication development in their young children with hearing loss. This study took place within the caregivers' home environments following intervention delivered by a speech-language-pathologist (SLP). Caregivers recorded videos using a conferencing platform (Zoom) to gather and send data. This chapter contains the results of the data collected from recordings of primary caregiver and child interactions following intervention. I presented the data systematically in relation to the research questions of the study:

- 1) After receiving training, to what extent will primary caregivers of young children who are deaf or hard of hearing be able to implement home-based communication interventions with fidelity?
- 2) What is the social importance of the intervention as perceived by primary caregiver participants?

Summary of Research Question One

In order to answer the first research question, I designed a multiple-probe study. Two primary caregiver participants, each along with a child completed baseline sessions by submitting ten-minute videos of the child playing with the caregiver. Once stable baseline data were established by the first caregiver participant, the first caregiver/child dyad completed an hour-long training session with me on caregiver-implemented communication facilitation strategies. The second caregiver received the training once stability in post-training behavior was exhibited by the first caregiver participant. The training strategies are part of a training program, S.T.A.R.R., published by the Sunshine Cottage School for Deaf Children (Sunshine Cottage School for Deaf Children, 2017).

Following the training, primary caregiver participants were instructed to create videos showing naturalistic interactions with their child using the Zoom video platform to record the interactions. These sessions were recorded for more than two weeks. After two weeks, primary caregiver participants were asked to record maintenance and generalization sessions using Zoom in the same manner that previous sessions were recorded.

Dependent Variables *Talk, Talk, Talk* and *Reciprocity*

Baseline

I collected baseline data on two target behaviors, *Talk, Talk, Talk* and *Reciprocity* from the S.T.A.R.R. training program. In order to receive the training, caregivers must have maintained stable caregiver behaviors in at least one of the two target behaviors. Baseline data were collected for a total of two weeks. Matthew completed nine baseline sessions and Grace completed eight baseline sessions. Word counts, the data collected for the *Talk, Talk, Talk* technique, were variable across sessions and stability was not exhibited. However, stability was more evident in both primary caregiver participant's exhibition of *Reciprocity*. Both participants exhibited percentages of responses to child efforts of within five percent for the final three baseline session for *Reciprocity*. Since *Reciprocity* was the dependent variable for which stability was shown in baseline, it was chosen as the primary dependent variable. See Table 13 for an illustration of baseline scores for both dependent variables.

Table 13*Baseline Scores*

Session Number	Talk, Talk, Talk	Reciprocity
	n	%
Matthew		
1	137	21%
2	170	35%
3	226	43%
4	190	30%
5	196	34%
6	207	38%
7	138	36%
8	161	37%
9	183	36%
Grace		
1	227	36%
2	384	48%
3	413	50%
4	395	63%
5	330	53%
6	293	47%
7	327	47%
8	295	52%

Note. For *Talk, Talk, Talk*, N = number of words produced by primary caregiver participant in each session. For *Reciprocity*, % = the percentage of caregiver responses to child efforts

Reciprocity

The primary dependent variable was the skill of *Reciprocity*. Figure 7 illustrates graphed data of the percentages of reciprocity exhibited by each primary caregiver participant during each recorded session. My visual analysis of this graphed data suggests that is a clear positive change in level and upward trend of data between conditions for both primary caregiver participants following the training received. There are no instances of overlapping data between baseline and intervention conditions and there is low variability in the intervention condition for both participants. The average Tau-U value for both primary caregivers' data was 1. This indicates a large effect (Parker et al., 2010). A summary of each primary caregiver participant's results related to the use of reciprocity follows.

Matthew. Visual analysis of *Reciprocity* for Matthew revealed a slight change in behavior as evidenced by upward trend following the training compared to baseline. However, since the percentage of reciprocity Matthew exhibited in the first recording following training was less than 80% (n= 60%), I held a 60-minute coaching session with Matthew via zoom to review target techniques. The coaching session was similar to the initial training session and included practice identifying the target skills, identifying target strategies, explicit teaching of the strategies, and a circular coaching process. I observed the primary caregiver carrying out target strategies while providing reflection and feedback. Then the caregiver and I developed an action plan and repeated steps of this circle as needed until the caregiver met mastery. Mastery was defined as showing reciprocity in 90% or more of opportunities during the coaching.

Following this coaching session, there was a larger positive change in behavior compared to baseline. At this time, there was a clear positive change in trend of data following the training and subsequent coaching session. Level was high and variability was low. There are no instances of overlapping data between baseline and intervention conditions. During baseline, Matthew's

use of reciprocity ranged from 21%-34% with a mean of 34.4%. In the intervention phase, data stability was achieved in sessions five through nine, as exhibited by reciprocity percentages that varied by five percent or less. The mean percentage of reciprocity Matthew exhibited was 79.6%. The total range of reciprocity Matthew exhibited after baseline was 60-87%.

Two weeks after the training session and completing recordings of interactions with his son, Matthew completed five maintenance sessions and five generalization sessions. Maintenance and generalization sessions were recorded in an alternating fashion: one maintenance session, two generalization session, two maintenance sessions, two generalizations session, two maintenance, one generalization session. During each maintenance sessions, I asked Matthew to continue recording interactions with his child using the same thematic activities used during post-training sessions (vehicles). The mean percentage of reciprocity Matthew exhibited during maintenance was 82%. The total range of reciprocity Matthew exhibited was 75-87%.

During generalization sessions, I asked Matthew to record interactions with his child using a novel activity – pop-up books. These interactions occurred two weeks after the initial training session in order to see how participants would be able to generalize target language facilitation strategies into new activities. The mean percentage of reciprocity was 73.6%. The total range of reciprocity Matthew exhibited during generalization was 69-75%.

Grace. Visual analysis of *Reciprocity* for Grace revealed a distinct change in behavior following the training compared to baseline. During baseline, Grace's use of reciprocity ranged from 36-63% with a mean of 49.5%. Following baseline, data clearly trended upward, exhibited low variability and high level. No data points overlapped.

In the intervention phase, Grace achieved data stability in sessions six through eight, as exhibited by reciprocity percentages that varied by five percent or less. The mean percentage of

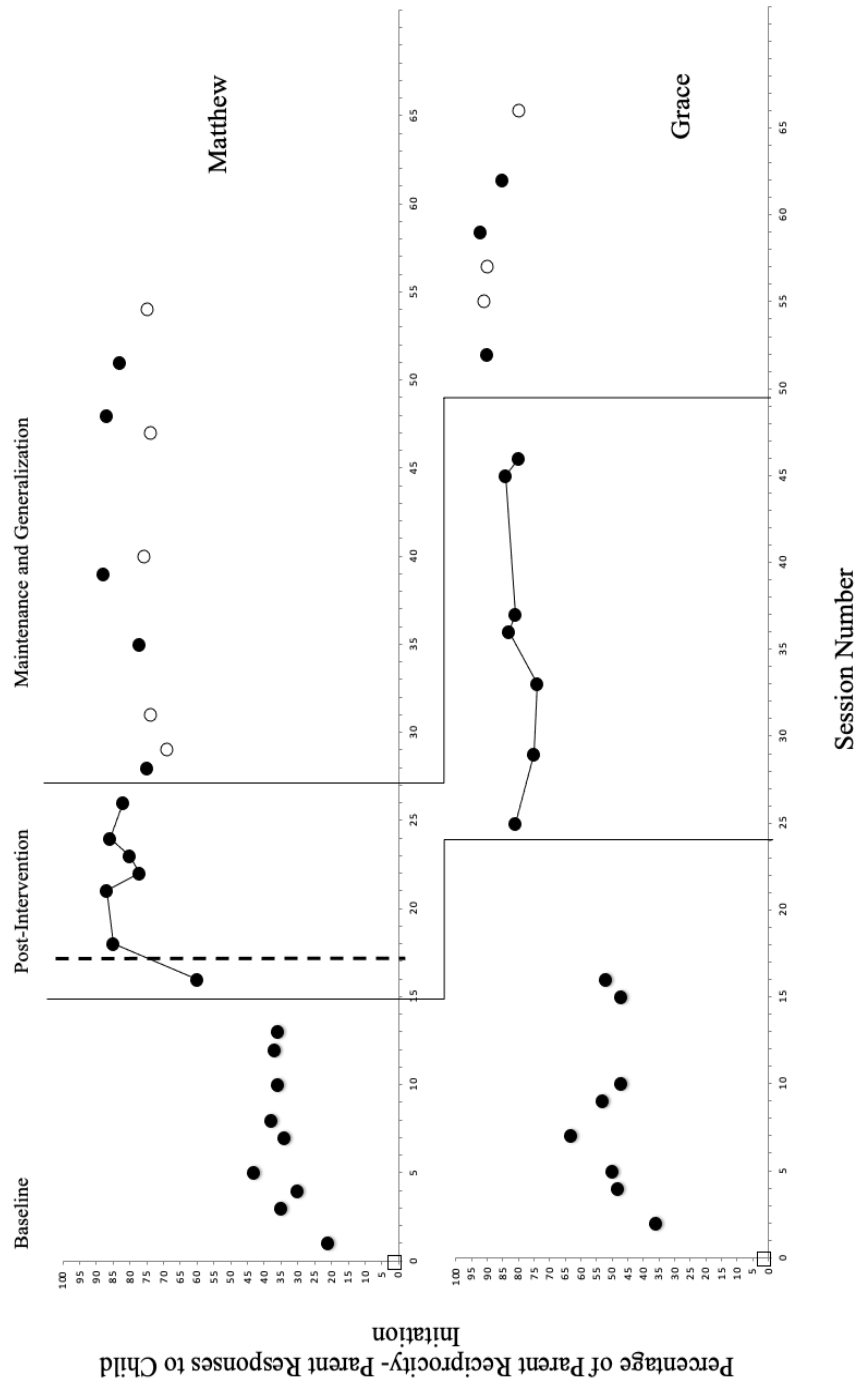
reciprocity Grace exhibited was 81%. The total range of reciprocity Grace exhibited after baseline was 79-84%.

Two weeks after the training session and completing recordings of interactions with her child, Grace completed maintenance and generalization sessions alternating in a similar fashion as Matthew (one maintenance, two generalizations, two maintenance). During maintenance sessions, I asked Grace to continue recording interactions with her child using the same thematic activities used during post-training sessions (using building-type toys). The mean percentage of reciprocity Grace exhibited during maintenance was 89%. The total range of reciprocity Grace exhibited during maintenance sessions was 85-92%. Maintenance and generalization sessions were recorded in an alternating fashion during the same period of time.

During generalization sessions, I asked Grace to record interactions with her child using a novel activity – pop-up books. These interactions occurred two weeks after the initial training session in order to see how participants would be able to generalize target language facilitation strategies into new activities. The mean percentage of reciprocity was 87%. The total range of reciprocity Grace exhibited during generalization was 80-91%.

Figure 7

Reciprocity



Note. Reciprocity percentage across participants. Dashed line indicates a coaching session. A closed circle indicates maintenance sessions and open circles indicates generalization sessions.

Talk, Talk, Talk

The second dependent variable behavior identified is *Talk, Talk, Talk*. Figure 8 illustrates graphed data of the percentages of reciprocity exhibited by each primary caregiver participant during each recorded session. My visual analysis of this graphed data revealed the data suggests that there is not a clear functional relationship between the training and the ability of primary caregivers to use the strategy of *Talk, Talk, Talk*. The Tau-U value for Grace was 0.30, indicating a small sized effect. The weighted average Tau-U of the two participants was 0.65, indicating a moderate effect (Parker et al., 2010). A summary of each primary caregiver participant's results related to the use of *Talk, Talk, Talk* follows.

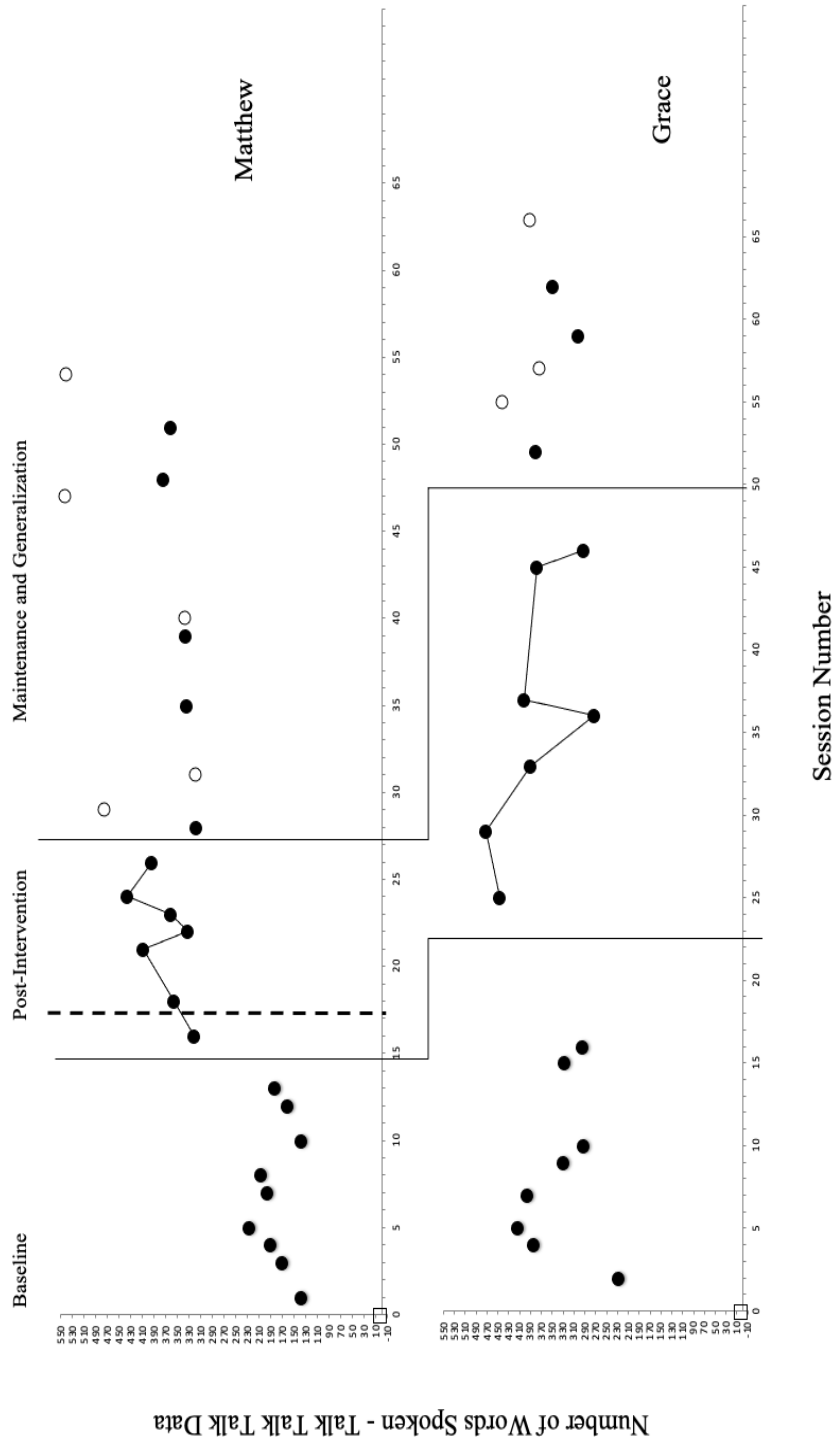
Matthew. Visual analysis of word count for Matthew revealed variable level. During the baseline condition, Matthew's mean word count was 178.7 and the total range was 137-226. Following the training session, Matthew's mean number of words produced per five-minute session was 372.5. The total range of words Matthew produced during this condition was 321-435. During maintenance sessions, Matthew's mean number of words produced per five-minute session was 344.6. The total range of words Matthew produced during maintenance sessions was 318-374. During generalization sessions, which I asked Matthew to use new and novel activities with his child, the mean number of words Matthew produced per five-minute session was 443.5. The total range of words Matthew produced during generalization sessions was 320-543.

Grace. Visual analysis of word count for Grace revealed variable level. During the baseline condition, Grace's mean word count was 333 and the total range was 227-413. Following the training session, Graces mean number of words produced per five-minute session was 378.9. The total range of words Grace produced during this condition was 272-472. During her three maintenance sessions, Grace's mean number of words produced per five-minute session was 343. The total range of words Grace produced during maintenance sessions was 301-

380. During the three generalization sessions, which I asked Grace to use new and novel activities with her son, the mean number of words Grace produced per five-minute session was 403. The total range of words Grace produced during generalization sessions was 375-443.

Figure 8

Talk, Talk, Talk



Note. Word count for each parent participant. Dashed line indicates a coaching session. A closed circle indicates maintenance sessions and open circles indicates generalization sessions.

Summary of Research Question Two/Social Validity

Research question two investigated the social validity of this study: What is the social importance of the intervention as perceived by primary caregiver participants? In order to answer this question, I designed two surveys. The first survey was completed by both participants prior to participating in the study and the second survey was completed by both participants following completion of study participation.

A combination of Likert-style questions and open-ended questions were in both surveys. The pre-training survey included 13 Likert-style questions using rating scales and three open-ended questions. The pre-training questions regarding knowledge and perceptions about primary caregiver implemented intervention related to communication skills prior to completing the training. The post-training survey included 19 Likert-type questions using rating scales and seven open-ended questions. Post-training surveys included questions regarding knowledge following completing the training, as well as perceived value in participation. See Appendix F for the pre-participation survey questions and Appendix G for the post-participation survey questions.

Pre-Participation Survey

Results of both open-ended and Likert-style questions revealed that, prior to participation in the study, both participants expressed high interest in and high perceived value of their upcoming participation in the study. They each reported that they thought the topic of this training was important, that participation in the training was feasible for their current lifestyle, and that the outcomes would be beneficial to themselves, their child, and their family as a whole. While both participants did express that they thought their respective children would benefit from their participation in the study, both also expressed that they felt their children would continue to need further communication intervention following the study. When asked what, if

anything, would be challenging during participation in the study, Matthew stated, “I think it will be challenging to keep Caleb engaged in an activity long enough to test out the communication techniques.” Grace expressed that a noisy house due to other children being present may present challenges during her participation. See Table 14 for specific responses to Likert-style questions and see Table 15 for specific responses to open-ended questions.

Table 14

Primary Caregiver Responses to Pre-Participation Social Validity Likert-Style Questions

Question	Matthew	Grace	Average (range)
I am interested in helping my child grow in his/her communication skills.	7	7	7 (7)
I think my participation in this study will be valuable.	7	7	7 (7)
The intervention will be effective in helping me learn strategies to increase my child’s communication skills.	7	7	7 (7)
My child will benefit from my participation in this study.	7	7	7 (7)
It is important for caregivers/parents to know how to help their children gain effective communication skills.	7	7	7 (7)
I am excited to participate in this training.	7	7	7 (7)
My participation in this training will not have a negative effect on my child.	7	7	7 (7)

(Table Continues)

(Table Continued)

Question	Matthew	Grace	Average (range)
This intervention could be appropriate for a variety of children.	7	7	7 (7)
This intervention will produce a lasting improvement in my child's communication skills.	7	7	7 (7)
This intervention will improve my child's communication skills so much that further intervention will not be needed.	2	4	3 (2-4)
My child's communication skills will likely remain at an improved level even after my involvement in this study is discontinued.	4	7	5.5 (4-7)
My participation in this study will help improve my child's communication skills at home and also in other settings (e.g., classroom, relatives' homes, etc.).	7	7	7 (7)
I will be able to use a computer or tablet and the Zoom platform successfully in order to participate in this study.	7	7	7 (7)

Note. 1: strongly disagree, 2: disagree, 3: somewhat disagree, 4: neither agree nor disagree, 5: somewhat agree, 6: agree, 7: strongly agree

Table 15

Caregivers' Responses to Pre-Participation Social Validity Open-Ended Questions

Question	Matthew	Grace
I am excited to:	Learn more about communication with my child.	Learn new communication techniques and see how impactful they are.
The following things might be challenging for me or my child during the study:	I think it will be challenging to keep Caleb engaged in an activity long enough to test out the communication techniques.	Noisy house from other kids.

Note. Caregiver responses to two open-ended questions on the pre-participation showed that caregiver participants were both excited to learn communication techniques but also felt there might be challenges to participation.

Post-Participation Survey

After completion of the training and this study, both participants expressed that their participation in this study provided value to their family (responses were “strongly agree” and “agree”). Both participants expressed that they felt like the training was sufficient to help them understand the five S.T.A.R.R. strategies (both responded “strongly agree”). Both participants agreed that they felt that the strategies taught during this training could be used to benefit a variety of children. Both participants responded that they are still interested in obtaining even more information about how to encourage communication development at home, following completion of this training. Following the training, each participant reported thoughts that were similar to the thoughts they held prior to participation - that they thought the topic of this training was important, that participation in the training was feasible for their current lifestyle, and that the outcomes would be beneficial to themselves, their child, and their family as a whole. See Table 16 for specific responses to Likert-style questions and see Table 17 for specific responses to open-ended questions.

Table 16*Primary Caregiver Responses to Post-Participation Social Validity Likert-Style Questions*

Question	Matthew	Grace	Average (range)
The training I received was sufficient to help me understand the five S.T.A.R.R strategies.	7	7	7 (7)
My participation in this study provided value to my family.	7	6	6.5 (6-7)
This training was effective in helping me learn strategies to increase my child's communication skills.	7	6	6.5 (6-7)
My child benefitted from my participation in this study.	7	6	6.5 (6-7)
I benefitted from my participation in this study.	7	7	7 (7)
It is important for caregivers/parents to know how to help their children gain effective communication skills.	7	7	7 (7)
I am glad that I participated in this training.	7	7	7 (7)
My participation in this study did not have a negative effect on my child.	7	7	7 (7)
The S.T.A.R.R. strategies could be appropriate for a variety of children.	7	7	7 (7)
I believe my participation in this study produced a lasting improvement in my child's communication skills.	7	6	6.5 (6-7)
My child's communication skills will likely remain at an improved level even after my involvement in this study is discontinued.	7	6	6.5 (6-7)
I feel confident in my ability to use the five strategies I learned during the training after my participation in this study is complete.	7	7	7 (7)
I am able to use many different toys, books, and materials while interacting with my child in a way that will help promote communication growth.	7	7	7 (7)

(Table Continues)

(Table Continued)

Question	Matthew	Grace	Average (range)
My participation in this study has helped improve my child's communication skills at home and also in other settings (e.g., classroom, relatives' homes, etc.).	7	6	6.5 (6-7)
I was able to use a computer or tablet and the Zoom platform successfully in order to participate in this study.	7	7	7 (7)
I learned new skills as a result of my participation in this study.	7	6	6.5 (6-7)
It was easy to find ten minutes per day to interact with my child alone to make the recordings.	7	6	6.5 (6-7)
It was challenging to find ten minutes per day to interact with my child alone to make the recordings.	1	2	1.5 (1-2)
I am still interested in helping my child grow even further in his/her communication skills.	7	7	7 (7)

Note. 1: strongly disagree, 2: disagree, 3: somewhat disagree, 4: neither agree nor disagree, 5: somewhat agree, 6: agree, 7: strongly agree

Table 17*Caregivers' Responses to Post-Participation Social Validity Open-Ended Questions*

Question	Matthew	Grace
1. What were the five communication facilitation techniques you learned?	Stay Close, Talk, Auditory Environment, Reciprocity, Repeat Routines	Stay Close, Talk Talk Talk, Auditory Environment, Reciprocity, Repeat Routines
2. How did your participation in this study help your child?	The participation exposed him to different vocabulary. It helped with his play skills	He enjoyed one on one time with me.
3. How did your participation in this study help you as a caregiver?	It brought me awareness on what I need to do when interacting with my son.	Focused one on one time with my child.
4. Did anything surprise you during your participation in this process? If so, what?	It surprised me how something so simple like “talk, talk, talk” can be beneficial for my child.	No.
5. The following things were challenging for me or my child during the study:	Keeping his attention at times.	N/A
6. What, if anything, do you see as a “next step” for you in learning how to use strategies to increase your child’s communication skills at home?	Find more time each day to interact with my son to practice the STARR strategies.	Learning more about language and auditory processing
7. Do you have any additional thoughts or questions for the researchers? If so, please record them here.	No response	N/A

Note. Responses to open-ended question revealed participant perceived benefits of study participation.

Inter-Observer Agreement

To calculate IOA, a second observer viewed 32.4% (n = 12) of randomly selected video recorded sessions from each of the two primary caregiver participants and each condition of the study (baseline, intervention, maintenance, and generalization). Following training, the second

observer coded two dependent variables using the same methods that I did. The second observer is a doctoral-level professor in a Special Education department at a Midwestern university, not affiliated with this dissertation. For the first dependent variable, *Talk, Talk, Talk*, the percent of occurrence agreement and percent of non-occurrence agreement were calculated after total count agreement was used to calculate the percentage of total agreement (i.e., smaller count/larger count x100). For the second dependent variable, *Reciprocity*, IOA was also calculated using total count agreement (i.e., smaller count/larger count x100). See Table 18 for inter-observer agreement results for both participants for all conditions.

Table 18

IOA for Data Reliability

Participant/ Condition	Talk, Talk, Talk	Reciprocity
<u>Matthew</u>		
Baseline	100%	98%
Intervention	98%	90%
Maintenance	100%	93%
Generalization	95.5%	98%
<u>Grace</u>		
Baseline	98%	98%
Intervention	97.5%	95%
Maintenance	96%	94.5%
Generalization	100%	98%

Note. The secondary coder viewed and coded 2 baseline, 2 intervention, 1 maintenance, and 1 generalization session for each participant. Total IOA for all conditions was greater than the target of 80% accurate.

Procedural Reliability

The secondary coder and I both recorded information related to procedural reliability, including observing how I trained the primary caregiver participants during both training and coaching sessions via a checklist coding the video-recorded sessions. The goal was to have 100% reliability, indicating that identical information had been presented to all participants during training sessions. The checklist can be found in Appendix D. See Table 19 for overall procedural reliability.

Table 19

Overall Procedural Reliability

Participant	Reliability
Matthew (intervention)	100%
Matthew (training)	100%
Grace (intervention)	100%

Note. Procedural reliability of 100% for both participants indicates that the primary investigator provided identical information to both participants during the initial training and during the coaching session for Matthew.

Chapter Summary

I reported the results of primary caregiver changes in behavior following completion of a training session in this chapter. In order to answer the first research question, two caregiver-child dyads participated in a training session on communication facilitation techniques presented in the Sunshine Cottage School for Deaf Children's *STARR – Parent Coaching Strategies for Listening and Spoken Language* program: **Stay Close**; **Talk, Talk, Talk**; **Auditory Environment**; **Reciprocity**; and **Repeat Routines**. I asked each caregiver and child dyad to send

two weeks of videos in of their child playing with them . After entering into intervention and receiving training, five strategies and explicit data were collected on two dependent variables: parent use of the skills of *Talk, Talk, Talk* and *Reciprocity*. Both participants exhibited positive changes in behaviors following the training. These positive changes continued in maintenance and generalization probes.

Each caregiver completed a pre- and post- participation to gauge caregiver-perceived value of this study in order to answer the second research question. Prior to participation, both participants expressed interest in participating in the training in order to learn potentially beneficial communication-skill-enhancing strategies to use with their young children. Following participation, both participants expressed perceived value in the training and also shared thoughts that this training would provide benefits to other children and caregivers.

CHAPTER V: SUMMARY AND DISCUSSIONS

In this study, I investigated the ability of caregivers to implement naturalistic communication facilitation strategies with fidelity after receiving training (and coaching, if needed) from a Speech-Language Pathologist via the Zoom video conferencing platform. I also investigated the social importance of the training program as perceived by primary caregiver participants. Two caregivers, each along with their child who presents with hearing loss, participated in this study. Results of this study supported the use of professional training and coaching in order to help caregivers be prepared to use naturalistic language facilitation strategies with their children within their home and daily environments. Results of social validity surveys indicated that caregiver participants saw high value in this kind of training. This chapter includes a summary and discussion of several important findings as a result of the study. Additional findings, limitations of the study, and recommendations for future research are also presented.

Key Findings

Findings of this study indicated that caregiver training and coaching can result in caregivers being able to use therapeutic language facilitation strategies with fidelity. This supports other research in the field, such as Roberts and Kaiser (2011), that suggests that parent-implemented language intervention or instruction, for children both with and without disabilities, can result in increased language skills. Children, both those with and without disabilities, show growth in language skills as a result of meaningful, every-day interactions with parents/caregivers (Chen et al., 2007).

During this study, one participant (Matthew) received both training and coaching while the other participant (Grace) received only the training. During the development of the study, it

was determined that if a participant was not able to exhibit the skill of *Reciprocity* with 80% or higher accuracy, that participant would receive a coaching session. During his first recorded session following training, Matthew exhibited the use of *Reciprocity* with 60% accuracy, whereas Grace exhibited the skill of *Reciprocity* with 81% accuracy. Following a coaching session, Matthew was able to exhibit the use of *Reciprocity* with 85% accuracy. It is suggested that practitioners who are training and coaching caregivers use individualized approaches – some caregivers/parents will likely need more support and others may need less. At times, parents and caregivers are unsure of how to best interact with their children in order to enhance language development and can benefit from coaching or teaching from professionals in order to feel better prepared to be a teacher to their children (Akamoglu & Dinnebeil, 2017).

In the review of the literature prepared prior to this study, 47 studies involving parent or caregiver training were investigated. Within these studies, a total of 177 parent/caregiver participants were involved with intervention. Of the total participants, 139 (84.2%) were female, 32 (19.4% were male), and for six (3.6%) participants there was no information reported on gender. Based on this information, a majority of participants in the parent-implemented communication intervention studies investigated are females. In this present study, there was one female participant and one male participant. While there was, of course, a very small number of participants it is encouraging to report that it appears that both men and women may be equally fully capable of acquiring communication facilitation skills through purposeful training and coaching.

Pre- and post-participation social validity surveys provided valuable information. Based on results of both open-ended and Likert-style questions, each participant reported thoughts following participation in the study that were similar to the thoughts they held prior to

participation. Responses to these questions indicated that primary caregivers of young children with hearing loss see the value in this kind of training. These findings are promising supports of the use of caregiver training for children who are deaf or hard of hearing who present with language delays. Both participants stated they thought the topic of this training was relevant, that participation in the training was feasible for their current lifestyle, and that the outcomes would be beneficial to themselves, their child, and their family as a whole. Both caregivers expressed that the ten-minute recordings that were required for the study were able to be completed without difficulty.

Additionally, both participants reported benefits of this study that extended past the specific research questions. One of the participants (Grace) reported in the post-participation survey that learning more about how to use purposeful, focused one-on-one time with her son was helpful to her as a caregiver. Matthew reported that his participation in this study helped him expose his son to more vocabulary in addition to helping his son with his play skills.

Limitations of the Study

There were several limitations present in this study that may have affected the results, interpretations, and implications. Although I tried to mitigate the limitations, the number of participants, stringent participant inclusion criteria, time of year the study was conducted, age range between participant children, relatively short duration of time the study was conducted during, and use of Zoom video conferencing contributed to possible limitations.

For the recruitment of this study, my survey link and description of the study was distributed via social media groups for parents of young children with communication delays. I asked interested primary caregivers to complete a brief Qualtrics survey to confirm inclusion criteria were met. Following receipt of survey responses, I reached out to each potential primary

caregiver participant via email to set up a time for an initial interview held via Zoom. Initially, five potential participants completed the Qualtrics survey. However, only three potential participants provided contact information and only two potential participants followed through with scheduling an initial Zoom interview with the primary investigator. I scheduled individual Zoom sessions with each of the two potential participants.

Unfortunately, although I would have preferred a minimum of three caregiver child dyads, only two dyads met the criteria of the study. However, both of the two caregiver participants were committed and highly motivated to complete the study tasks. Each caregiver participant recorded more than twenty sessions which produced a significant amount of data to analyze. Ideally, this study could be replicated with a larger number of participants to look for similar results. As previously stated, since the present study had only two participants it is not possible to state that the intervention had a functional effect on caregiver skills.

The inclusion criteria for participants of this study were quite stringent: a primary caregiver of a child with any degree of hearing loss, who is 18 months through five years of age, and has a diagnosed or suspected language disorder. I specifically target the early childhood years because of the lack of research found in my initial search combined with the knowledge that the early years are critical for language development (ASHA, 2008; Akamoglu & Dinnebeil, 2017). However, the limited age range requirement led to a limited number of participants with hearing loss who could participate in the study. My suggestion is for future researchers to allow for participants with a larger age-range of children with hearing loss in order to attempt to attract a larger number of participants. Additionally, future researchers could also consider allowing primary caregivers of children who do not have hearing loss or deafness who present with language delays to participate.

Because of the timeline of my dissertation, I had participants completing all phases of this study between November and January. For many families, this time of year that falls during many winter events and can be particularly busy and complicated. This resulted in both participant families having conflicts that prevented them from consistently recording sessions, two to three per week was my original target goal. Although each caregiver submitted at least one video once per week, it could have been easier to have a more consistent structure during a different time of year.

Because the criteria were for early childhood, ages 18 months to five years, I accepted the caregiver-child dyads which resulted in one child at 20 months of age at the start of the study and the other four years, six months old. The variance of 34 months represents a large difference in communication skills and the natural way that parents or caregivers interact with each child (Kapengut & Noble, 2020). Children at these different ages are learning and acquiring language skills at vastly different rates. These differences could have influenced the respective primary caregiver participants and the way that they interacted with their child in all phases of this intervention. If this study is replicated, it could be useful to do so with a larger number of dyads with several children around the same age range.

This study took place over a period of ten weeks following one training session and, for one participant, one coaching session. It is suggested that a similar study could take place using more training sessions over a longer period of time to investigate even further potential changes in caregiver behavior.

A video conferencing modality, using the Zoom platform, was chosen for this study due to the increase in the use of such tools in service delivery models with very little research to support it. Additionally, this dissertation was started during the Covid 2019/2020 pandemic

which led to Zoom being the option chosen to keep all participants safe. Because of this platform, I was unable to efficiently measure any of the other strategies in the S.T.A.R.R. framework (i.e., *Stay Close*, *Auditory Environment*, and *Repeat Routines*) due to not being in person. It is likely that findings in this study might be different if the primary caregiver trainings took place in a face-to-face manner as opposed to via Zoom. While the information gathered in this study is valuable because it is adding to a body of research of using an online platform, it is important to consider the fact that further research in face-to-face caregiver coaching could also be valuable (Sone et al., 2021).

Recommendations for Future Research

The present study took place over a period of approximately 8 weeks. Further, it only included one caregiver training session for each caregiver participant and, for one caregiver participant, one coaching session. A longer-term study investigating the long-term ability of caregivers to learn all five of the S.T.A.R.R. strategies using additional training sessions over a longer period time could provide valuable information to the field.

For the purposes of this study, I chose to use the video conferencing platform Zoom. It is suggested that a similar study take place investigating training caregivers in language facilitation strategies in an in-person face-to-face fashion in order to compare effectiveness of the two modalities. It is possible that the use of Zoom in this present study created a more natural feel for the primary caregiver participants and children. Participants set up their computer to record and interact with their child naturally without an unfamiliar person present in their home watching.

Pediatric practitioners are often not prepared to use adult-learning strategies when working with caregivers/families of young children with disabilities (Rush, 2018). It could provide valuable information to the field of special education if more information was gathered

regarding the knowledge of professionals in these areas as well as gaps in knowledge in order to help best prepare professionals to work effectively with families.

The ways that caregivers interact with their child during different times of day and/or different days of the week could be different based on a variety of factors (fatigue, stress, family schedules, distractions, etc.). More information about what times or day and/or days of the week could be the most beneficial for improved communication outcomes could be useful.

Ramifications of this information could include having clear support for recommendations of times of day to suggest therapeutic caregiver/child interactions.

The measures utilized within this study to investigate caregiver use of *Talk, Talk, Talk* only considered the quantity of words spoken by each caregiver and did not look into the quality of the spoken input. Variability in the number of words produced session to session could be due to a wide variety of factors. For example, if a caregiver participant was utilizing wait time (pausing after saying something and allowing the child time to respond), the rote word count may be lower. Since we know that wait/pause time is an effective naturalistic language facilitation strategy (Brown & Woods, 2016), it is not incorrect for caregivers to offer these periods of time with no verbal language input while they allow time for the child to respond. Furthermore, measures used during *Talk, Talk, Talk* did not look at the type of vocabulary presented to the child participants or consider the ages of the participants. It is likely that caregivers of children of different ages provide different kinds of language input due to individual child's skills.

Looking at the effects of the S.T.A.R.R. strategies on caregivers of children of varying types and degrees of hearing loss and, conversely, the effects of the use of these strategies on the children themselves, could provide valuable knowledge. In this study, one child had a profound

unilateral loss and the other child had a mild bilateral loss. Conducting a similar study with more children presenting with varying types and degrees of hearing loss could be useful. At times, children with mild losses do not receive intensive direct services through Early Intervention programming because their development may appear to be on track (Moeller, 2000). However, it is not unusual for language gaps to appear later on in these children's lives. The use of teaching the S.T.A.R.R. program as preventative strategies to caregivers of young children who present with mild losses could be investigated in more depth.

While the present study investigated the ability of caregivers to gain skills in the area of learning how to functionally use naturalistic language facilitation strategies with their young children who present with language delays, it did not investigate the possible effects on the children's language skills. A study investigating the effect of caregiver-implemented language facilitation intervention using the strategies outlined in the S.T.A.R.R. program could provide valuable information for practitioners and families of young children with language delays.

While the Sunshine Cottage School for Deaf Children's *STARR – Parent Coaching Strategies for Listening and Spoken Language* program was written for parents/caregivers of young children who are deaf or hard of hearing, the techniques and strategies discussed are applicable to a wider population of children. It is suggested that a future study take place investigating the use of parent/caregiver training and coaching using these strategies with caregivers of young children who have language delays not related to hearing loss. Additionally, a caregiver training study for caregivers of young children who are deaf or hard of hearing using other parent/caregiver training programs could be considered. For example, the It Takes Two to Talk program (Weitzman, 2017), a program developed to train parents and caregivers of young children birth to age five who present with language delays in naturalistic language facilitation

strategies, does not have related published research on its efficacy with the deaf or hard of hearing population.

It is also suggested that considerations of additional naturalistic language facilitation strategies to supplement the five S.T.A.R.R. strategies be made. For example, purposeful teaching of other naturalistic strategies such as prompting, pause time, and explicit modeling could pair with the S.T.A.R.R. strategies.

Practical Implications

Professionals who work with young children who are deaf or hard of hearing, including Speech-Language Pathologists and others, should consider the importance of training/coaching caregivers to use naturalistic, therapeutic language-facilitation strategies in their homes with their young children to enhance the effects of any language intervention the child is receiving. While caregiver-implemented intervention/use of therapeutic strategies should not be a replacement for intervention services provided by a professional such as a speech-language pathologist or a teacher of the deaf, caregivers can serve as important partners in the therapeutic/educational process and can help their children continue to make gains in their functional communication skills within their home environment (Akamoglu & Dinnebeil, 2017; Wietzman, 2017). Furthermore, a program like S.T.A.R.R. could help provide a framework that may be helpful both for the professionals who are teaching caregivers and for the caregivers who are learning the skills.

Results of this study indicate that it is possible for caregivers of young children who are deaf or hard of hearing who present with language delays are able to implement naturalistic language facilitation strategies within their home environment, such as simply talking more to their child (the S.T.A.R.R. strategy *Talk, Talk, Talk*) and responding with reciprocity (the S.T.A.R.R. strategy *Reciprocity*) to each of their child's verbal and non-verbal communicative

efforts. These are two strategies that could be easily integrated into therapy sessions with young children and could be taught to caregivers of these children using modeling and coaching.

Both participants in this present study expressed concerns with their ability to effectively complete the required 10-minute recorded interactions with their child. One participant expressed concern regarding keeping his son engaged. The other participant expressed concern regarding potential distractions from other children in the home environment. By the end of their participation in the study, both participants expressed that they did not have difficulty making the 10-minute recordings and roadblocks were not hinderances at all. Furthermore, at the end of the study both participants expressed that they found value in the purposeful 10-minute interactions with their child and that their children also enjoyed the one-on-one time. While parents may express hesitation over the thought of having the time to dedicate to working on language facilitation techniques at home, it is important to show them that they can make an impact on their child by using just small windows of time.

Chapter Summary

Overall, the outcomes of this study were positive. Two primary caregiver participants completed this training and exhibited gains in their ability to use naturalistic language facilitation strategies with their young children who are deaf or hard of hearing following a training administered by an SLP via Zoom. Furthermore, both caregivers reported that they thought the topic of this training was important, that participation in the training was feasible for their current lifestyle, and that the outcomes would be beneficial to themselves, their child, and their family as a whole. While this study did have some encouraging findings regarding the efficacy of caregiver-implemented communication strategies, these findings must be interpreted with caution due to the limitations described above. It is suggested that the recommendations for

future studies described in this chapter be considered by researchers who are interested in furthering the research to support the use of caregiver-implemented communication facilitation intervention.

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APPENDIX A:

DATA COLLECTION FORM

PARTICIPANT _____

CODER _____

SESSION DATE _____

START AT (time) _____

ACTIVITY _____

TALK, TALK, TALK

20,000 words/day= 27.8 words/min if 12 waking hours; 33.33 words/min if 10 waking hours

<i>Interval</i>	Words Produced (tally) <i>GOAL: Giving the child a target estimated 20,000 words heard/exposed to per day.</i>	TOTAL
1:00		
2:00		
3:00		
4:00		
5:00		
<i>GRAND TOTAL NUMBER OF WORDS</i>		

RECIPROCITY

Responding to something the child comments on or shows interest in within 3 seconds	Number of “child efforts”	Parent/caregiver responses within 3 seconds of a “child effort”
1:00		
2:00		
3:00		
4:00		
5:00		
TOTAL		
Caregiver responses/Child efforts = X%		

APPENDIX B:
CAREGIVER TRAINING OUTLINE

I. Introductions

II. State the purpose of the training

III. Overview of S.T.A.R.R program

IV. Training on each of the five strategies

A. Stay Close

1. Provide definition and rationale
2. View video example
3. Discuss

B. Talk, Talk, Talk

1. Provide definition and rationale
2. View video example
3. Discuss

C. Auditory Environment

1. Provide definition and rationale
2. View video example
3. Discuss

D. Reciprocity

1. Provide definition and rationale
2. View video example
3. Discuss

E. Repeat Routines

1. Provide definition
2. View video example
3. Discuss

V. Review

VI. Questions and Answers

APPENDIX C:
CAREGIVER TRAINING SCRIPT

Primary Investigator:

Hello! Thank you for participating in the training!

How have the new toys worked for you and your child?

What toys does he/she gravitate toward?

What holds his/her attention?

What does he/she find exciting?

You have done an amazing job sending great videos of interactions with your child!

How was this process for you?

Did anything surprise you?

Was anything difficult for you?

Have you had any thoughts or learned anything as you worked through creating these videos?

Remember, YOU are the expert in your child!

One of my goals for this experience is to **empower** you as a parent/caregiver and to support the truth that I strongly believe –

you are the expert in your child and the one who is best suited to positively affect his/her communication development

You supply the love, parental intuition, and dedication

I'll supply the instruction and coaching in *research-based communication-enhancing strategies that you can use RIGHT NOW* in your home and anywhere that you and your child go!

I want to help you make simple lifestyle adjustments that will make interacting with your child in communication-enhancing ways natural and FUN! These skills and habits will become things that you don't need to over-think.

Next, I will give you information about how learning may take place.

Multi-modal instruction, or instruction that takes place in more than one way, is more effective for most people than instruction that happens in only one way

Hearing

Seeing

Experiencing

This program uses the Sunshine Cottage School for Deaf Children's STARR framework

This framework gives parents/caregivers the opportunity to learn things about using communication-enhancing strategies with their children in a variety of ways./

The five strategies we will be discussing today that are part of the S.T.A.R.R. program are:

S - Stay Close

T - Talk, Talk, Talk

A- Auditory Environment

R - Reciprocity

R - Repeat Routines

Next, I will give you an overview of the teaching framework we will use today.

1. Teach the concept of an individual "letter" of S.T.A.R.R

2. Video example

3. Discussion of possible “behind-the-scenes” thoughts you could cultivate as you consider future interactions with your child – including rehearsing how to think about each of the points of the star **before** and **during** interactions with your child will help each point become automatic

Now, we will discuss each of the five points of the star.

The first point on the star is “S” for *Stay Close*.

- During as many interactions as possible
- Stay on the child’s level
- Creative seating to bring you to each other’s level
- Be interactive – “stay and play”

Now, let’s watch a video example of this skill.

Did you see the parent using this skill with his child? (Discuss)

Here are some thoughts you could have “behind the scenes” related to this skill:

- “How can I adjust my body or the environment to be closer to my child?”
- If my child moves away, which is more productive – for me to follow him/her OR for me to coax him/her back to me? Do you have any questions about Stay Close?

The second point on the star is “T” for *Talk, Talk, Talk*.

- About every-day events
- While sharing books
- While playing with toys
- While cleaning up
- Using songs and rhymes

Now, let’s watch a video example of this skill.

Did you see the parent using this skill with his child? (Discuss)

Here are some thoughts you could have “behind the scenes” related to this skill:

- Think about child-friendly words to use during play schemes
- Think about emphasizing exciting or important words
 - Vary your voice
 - Use sound effects – animal sounds, environmental sounds
- Repeat what your child says and add more
- Don’t over-think

The third point on the star is “A” for *Auditory Environment*.

- Stay close!
- Reduce/eliminate background noise
- Sit on your child’s “best” side
- Consider distractions
- Make sure hearing technology (if used) is functional and ON

Now, let’s watch a video example of this skill.

Did you see the parent using this skill with his child? (Discuss)

Here are some thoughts you could have “behind the scenes” related to this skill:

- “How can I adjust the environment to make my child’s hearing and attention be maximized?”
 - Control what we can control
 - Turn off electronics
 - Use a louder voice
 - Adjust our body’s position in relation to our child’s best hearing ear

The fourth point on the star is “R” for *Reciprocity*.

- Share joint reference – make what is exciting to your child exciting to you!
- Take turns
- Follow your child’s lead
- Keep the conversation going
- Predict your child’s intent

Now, let’s watch a video example of this skill.

Did you see the parent using this skill with his child? (Discuss)

Here are some thoughts you could have “behind the scenes” related to this skill:

- Respond/react to everything your child does
- Follow your child’s lead
- Go with THEIR flow whenever possible
- Remember the overlap of all of the “points” of the star – stay close and talk, talk, talk in particular!

The fifth and final point on the star is the second “R” for *Repeat Routines*.

- Follow daily routines
- Develop a “language script” – repeated/predictable language
- Examples: bath time, mealtimes, reading books, brushing teeth, etc.

Now, let’s watch a video example of this skill.

Did you see the parent using this skill with his child? (Discuss)

Here are some thoughts you could have “behind the scenes” related to this skill:

- If it HELPS you, write a script!
- Share this script with other family members

- Use your phone or other technology to make a “book” about your routine
 - Photo album in your phone or tablet
 - Pair language with each picture and ”read” with your child prior to and/or after participating in the routine

Now, let’s review all of the strategies! What do you remember?

What is the acronym we talked about today? (S.T.A.R.R.)

What does each point of the star stand for? (S: Stay Close; T: Talk, Talk, Talk; A: Auditory Environment; R: Reciprocity; R: Repeat Routines)

GREAT JOB!!

Here are our next steps:

- Make more videos, thinking about what we talked about tonight.
- Over the next week, have FIVE VIDEOS on five different days be your goal
- After that, we will touch base again
- We might zoom again, we might not

What questions do you have for me?

Thank you for your willingness to participate in this study! I hope you find it beneficial for you, your child, and the rest of your family...and maybe a little fun, too!

APPENDIX D:
PROCEDURAL FIDELITY

PARTICIPANT _____

VIEWER _____

SESSION DATE _____

VIEWED ON DATE _____

Did you observe the following?

1. Purpose of the training stated.	YES	NO
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I am a graduate student in the College of Education Doctoral program in Special Education at Illinois State University. I am conducting a study that involves training parents/primary caregivers of children with identified hearing loss in techniques they may use at home to encourage increased communication skill development via Zoom. I am seeking participation for this study as I feel it will benefit children and families by helping to promote increased communication skill development.

2. Overview of S.T.A.R.R program provided	YES	NO
---	-----	----

3. Training on S: Stay Close

a. Provided definition and rationale	YES	NO
--------------------------------------	-----	----

b. Shared video example	YES	NO
-------------------------	-----	----

c. Discussed other related thoughts	YES	NO
-------------------------------------	-----	----

4. Training on T: Talk, Talk, Talk

a. Provided definition and rationale	YES	NO
--------------------------------------	-----	----

b. Shared video example	YES	NO
-------------------------	-----	----

c. Discussed other related thoughts	YES	NO
5. Training on A: Auditory Environment		
a. Provide definition and rationale	YES	NO
b. View video example	YES	NO
c. Discuss	YES	NO
6. Training on R: Reciprocity		
a. Provide definition and rationale	YES	NO
b. View video example	YES	NO
c. Discuss	YES	NO
7. Training on R: Repeat Routines		
a. Provide definition	YES	NO
b. View video example	YES	NO
c. Discuss	YES	NO
8. Review		
a. Verbally review each aspect of S.T.A.R.R.? YES		NO
9. Questions and Answers		
a. Did the SLP ask the caregiver if they had questions?	YES	NO
b. Did the SLP answer the questions?	YES	NO

APPENDIX E:
COACHING PROCEDURES

1. State the purpose of the coaching session
2. Review an overview of S.T.A.R.R program
3. Review each of the five strategies
 - a. Stay Close
 - i. Provide definition and rationale
 - ii. Opportunity for practice
 - iii. Discuss – Reflection and feedback
 - b. Talk, Talk, Talk
 - i. Provide definition and rationale
 - ii. Opportunity for practice
 3. Discuss – Reflection and feedback
 - c. Auditory Environment
 1. Provide definition and rationale
 2. Opportunity for practice
 3. Discuss – Reflection and feedback
 - d. Reciprocity
 1. Provide definition and rationale
 2. Opportunity for practice
 3. Discuss – Reflection and feedback
 - e. Repeat Routines
 1. Provide definition

2. Opportunity for practice

3. Discuss – Reflection and feedback

V. Review

VI. Questions and Answers

APPENDIX F:
CONSENT FORM

I am a graduate student in the College of Education Doctoral program in Special Education at Illinois State University. I am conducting a study that involves training parents/primary caregivers of children with identified hearing loss in techniques they may use at home to encourage increased communication skill development via Zoom (a video conferencing platform).

I am seeking participation for this study as I feel it will benefit children and families by helping to promote increased communication skill development. I am looking for parents/primary caregivers of children aged 18 months through 5 years, 0 months who (a) have a diagnosis of any degree of hearing loss and (b) exhibit some delays in communication skill development.

This study would require your commitment for approximately 7 weeks. Daily commitments would range from 0 minutes to 30 minutes, with most days requiring a 5-minute commitment.

You will be required to, after training, use the Zoom video conferencing platform to record short 5-minute interactions between yourself and your child and then share these videos with the researchers. Training will be provided on how to record and share these videos with the researchers.

You will need access to a computer or tablet with internet connectivity in order to participate. If you do not have access to these materials but are interested in participating in this study, please contact me and we will look into options for loaning materials.

Your participation in this study would be completely voluntary, and should you choose to participate and then change your mind, you may discontinue participation at any time.

Thank you very much for your time and interest in this study. Your participation would be extremely helpful in my quest to determine if parents/primary caregivers are able to learn and to implement home-based communication facilitation strategies. Please contact me via email (rlwells1@ilstu.edu) or phone (309-438-2405) at any time if you would like to participate in this study or if you have any questions.

In order to gauge your eligibility to participate in this study, please complete the following short survey.

1. Are you interested in participating in a seven-week long study involving learning about techniques you can use at home to encourage communication skill development in your child?

Yes

No

2. Are you the primary parent/caregiver of a young child who has a diagnosis of a hearing loss (of any degree)?

Yes

No

3. Is your child between 18 months and 5 years, 0 months of age?

Yes

No

4. How old is your child? _____

5. Do you have concerns with your child's communication skills?

Yes

No

You are being asked to participate in a research study conducted by Rachel Wells, Doctoral Candidate at Illinois State University and supervised by Yun-Ching Chung, Ph.D., Professor and Doctoral Program Coordinator in the Special Education Department at Illinois State University.

The purpose of this study is to explore how caregivers/parents of young children who are deaf or hard of hearing are able to learn communication facilitation strategies to use with their children to promote communication development.

This study is funded by a Foundations Grant through Thomas Metcalf Laboratory School at Illinois State University.

Why are you being asked? You have been asked to participate because you are a caregiver/parent of a young child (aged 18 months through 5 years of age) who is either deaf or hard of hearing and presents with communication delays. Your participation in this study is voluntary. You will not be penalized if you choose to skip parts of the study, not participate, or withdraw from the study at any time. You are ineligible to participate if you are currently within the European Economic Area.

What would you do? If you choose to participate in this study, you will be asked to make videos of natural interactions/play with your child. The researchers will view these videos and make observations about the way that you interact with your child. You will also be asked to participate in training sessions via Zoom during which you will learn simple strategies to use at home during interactions with your child to promote communication skill development. In total, your involvement in this study will last approximately six to seven weeks.

Each week you will be asked to (a) prepare five 5-minute videos during a time that is best for you and your child and (b) participate in 1-4 Zoom sessions with the primary researcher. Zoom sessions will be approximately 15 minutes long. The 5-minute videos that you record will be recorded via Zoom through a private Zoom link that will be shared with you by the researcher.

Are any risks expected? There are potential, though minimal, risks to participating in this research. There may be a risk of discomfort to you as you learn new skills. You may, however, withdraw at any time. You will experience the loss of time associated with completing tasks related to the study. Again, you may withdraw at any time if this becomes too much for you. There is a potential for the loss of confidentiality which could result in personal discomfort. However, this risk will be minimized due to the fact that the written research paper will not contain personally identifiable information.

Will your information be protected? We will use all reasonable efforts to keep any provided personal information confidential. Written information as well as video recorded information will be stored on OneDrive. Data will be destroyed by deleting it from OneDrive within two years following the completion of this study. Information that may identify you or potentially lead to reidentification will not be released to individuals that are not on the research team. After your data has been deidentified, research may be disseminated through written articles and/or

educational conferences. Additionally, the deidentified data may be used in future research projects. However, when required by law or university policy, identifying information (including your signed consent form) may be seen or copied by authorized individuals.

Could your responses be used for other research? We will not use any identifiable information from you in future research, but your deidentified information could be used for future research without additional consent from you for up to two years following the completion of this study.

Will you receive anything for participating? By agreeing to participate in this study, you will be offered a kit of toys with a value of approximately \$75. The IRS may consider these payments to be taxable compensation. You may want to consult with your personal tax advisor for advice regarding this situation. In order to receive this compensation for participation in the study, you must complete a participant receipt form. These forms are used to meet federal reporting guidelines but will be handled only by university employees who have signed confidentiality agreements and who will ensure the information is handled in a secure manner. No research data will be associated with these forms. You may participate in the study without compensation if you do not wish to complete this form.

Who will benefit from this study? You may learn some valuable techniques that you may use at home with your child to enhance his or her communication skills; there will be no other direct benefits to you as a result of participation in this study. However, teachers, therapists, administrators, students, and other parents will benefit from your participation through the completion of the study and dissemination of the implications and findings.

Whom do you contact if you have any questions? If you have any questions about the research or wish to withdraw from the study, contact Rachel Wells at (309) 438-2405 or rlwells1@ilstu.edu OR Yun-Ching Chung at (309) 438-2460 or ychung@ilstu.edu.

If you have any questions about your rights as a participant, or if you feel you have been placed at risk, contact the Illinois State University Research Ethics & Compliance Office at (309) 438-5527 or IRB@ilstu.edu.

You will be given a copy of this form for your records.

Documentation of Consent:

Select YES below if you are 18 or older and willing to participate in this study.

YES

NO

APPENDIX G:

PRE-PARTICIPATION SOCIAL VALIDITY SURVEY

You will receive training in caregiver-implemented communication strategies over the next several weeks to help you be able to work in increasing communication skills with your child in your home environment via Zoom (a video conferencing platform).

Please let the researchers know your knowledge and thoughts at this point prior to your participation in the study by completing this survey.

Thank you very much for your time and investment in this study, your child's communication skills, and future children and families!

1. What is your participant number? (Number given to you by the researcher)
2. Choose the option that best describes your agreement with each statement.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I am interested in helping my child grow in his/her communication skills.							
I think my participation in this study will be valuable.							
The intervention will be effective in helping me learn strategies to increase my child's communication skills.							
My child will benefit from my participation in this study.							

It is important for caregivers/parents to know how to help their children gain effective communication skills.							
I am excited to participate in this training.							
My participation in this study will not have a negative effect on my child.							
This intervention could be appropriate for a variety of children.							
This intervention will produce a lasting improvement in my child's communication skills.							
This intervention will improve my child's communication skills so much that further intervention will not be needed.							
My child's communication skills will likely remain at an improved level even after my involvement in this intervention program is discontinued.							

My participation in this intervention study will help improve my child's communication skills at home and also in other settings (example: classroom, relatives' homes, etc.).							
I will be able to use a computer or tablet and the Zoom platform successfully in order to participate in this study.							

3. Do you have any comments or questions about your participation in this study?

4. I am excited to:

5. The following things might be challenging for me or my child during the study:

APPENDIX H:

POST-PARTICIPATION SOCIAL VALIDITY SURVEY

Congratulations! You completed the study in caregiver-implemented communication strategies to help you be able to target increasing communication skills with your child within your home environment.

Please let the researchers know your knowledge and thoughts at this point after your participation in the study by completing this survey.

Thank you very much for your time and investment in this study, your child's communication skills, and future children and families!

1. What is your participant number? (Number given to you by the researcher)

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
The training I received was sufficient to help me understand the five target S.T.A.R.R strategies.							
My participation in this study provided value to my family.							
This intervention was effective in helping me learn strategies to increase my child's communication skills.							
My child benefitted from my participation in this study.							

I benefitted from my participation in this study.							
It is important for caregivers/parents to know how to help their children gain effective communication skills.							
I am glad that I participated in this training.							
My participation in this study did not have a negative effect on my child.							
The S.T.A.R.R. strategies could be appropriate for a variety of children.							
I believe my participation in this study produced a lasting improvement in my child's communication skills.							
My child's communication skills will likely remain at an improved level even after my involvement in this study is discontinued.							
I feel confident in my ability to use the five strategies I learned during							

this training after my participation in this study is complete.							
I am able to use many different toys, books, and materials while interacting with my child in a way that will help promote communication growth.							
My participation in this study has helped improve my child's communication skills at home and also in other settings (example: classroom, relatives' homes, etc.).							
I was able to use a computer or tablet and the Zoom platform successfully in order to participate in this study.							
I learned new skills as a result of my participation in this study.							
It was easy to find ten minutes per day to interact with my child alone to make the recordings.							

It was challenging to find ten minutes per day to interact with my child alone to make the recordings.							
I am still interested in helping my child grow even further in his/her communication skills.							

2. What were the five communication facilitation techniques you learned?
3. How did your participation in this study help your child?
4. How did your participation in this study help you as a caregiver?
5. Did anything surprise you during your participation in this process? If so, what?
6. The following things were challenging for me or my child during the study:
7. What, if anything, do you see as a "next step" for you in learning how to use strategies to help increase your child's communication skills within your home environment?
8. Do you have any additional thoughts or questions for the researchers? If so, please record them here.