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UNIVERSITY OF NORTHERN COLORADO

Greeley, Colorado

The Graduate School

**TEACHERS' REPORT OF STRATEGIES USED TO FACILITATE LANGUAGE
DEVELOPMENT IN STUDENTS WITH HEARING LOSS**

**A Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Education**

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**College of Education and Behavioral Sciences
School of Special Education**

August, 2013

This Dissertation by: Candace Michele Handley

Entitled: *Teachers' Report Of Strategies Used To Facilitate Language Development In Students With Hearing Loss*

has been approved as meeting the requirements for the Degree of Doctor of Education in College of Education and Behavioral Sciences in School of Special Education, Program of Special Education.

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ABSTRACT

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The purpose of this study was to identify the extent to which teachers of the deaf report using four identified language facilitation strategies: recasting, extension, responsivity, and self-talk/parallel talk. Participants self-selected in response to an advertisement on a state-wide listserv and to the state's residential school internal news. Fifty-seven ($n=57$) completed questionnaires were collected via an internet-based survey. Participants taught primarily in self-contained and itinerant settings, and used Total Communication for instruction. They represented brand new teachers (first year teaching) through expert (more than 25 years), and all grade levels (early intervention through 12th grade). The respondents reported using all of the strategies to a high degree. Although significant relationships were identified between the use of extensions and two independent variables, the limitations of the study undermine the results and significance should be interpreted with caution. Implications for practice are not clear at this point. Further research is indicated that would focus on observing teachers' use of the four strategies with special attention paid to the influence of years of experience and communication modality on the use of the strategies.

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CHAPTER I

INTRODUCTION

Background

Since the beginning of deaf education in the 1700s, the debate over which language modality should be used to teach children with hearing loss has raged, with the most vocal proponents advocating for either spoken language or natural signed language (e.g., French Sign Language, American Sign Language) (Easterbrooks & Baker, 2002). In the 1800s, this debate was played out by two very notable people in the history of deaf education in the United States, Edward Minor Gallaudet, founder of Gallaudet University, and Alexander Graham Bell, son of the inventor of Visible Speech (a writing system that uses symbols to represent the oral mechanisms of speech). Despite no lack of passion on either side, they were unable to resolve the issue of how best to teach language to children with hearing loss.

Unfortunately, this debate continues to this day, and has taken up much of the attention in the field (Easterbrooks & Stephenson, 2006). In recent years, there has been an attempt to focus on identifying practices that work, rather than on language modality (i.e., speech versus sign). This is due in part to the passage of the No Child Left Behind Act (2001). It called for the use of evidence-based practice in education. As a result, attention was turned to the body of

research with students with hearing loss to identify what practices are evidence-based (Easterbrooks & Stephenson, 2006; Luckner, Sebald, Cooney, Young, and Muir, 2005/2006).

Evidence-based Practices in Deaf Education

Luckner et al. (2005/2006) performed a synthesis of 40 years of literature related to literacy practices with deaf students. The original intent was to run a meta-analysis on the data. However, out of 964 articles published in peer-reviewed journals, only 22 studies met the definition of empirical research. This low number of studies made running a meta-analysis impossible. This was startling and caused a ripple in the field. It brought to light that many of the practices that were believed to be sound had little or no research to support their effectiveness (e.g., language experience approach, bilingual education, journaling) (Easterbrooks, 2005).

This data set of 964 articles was subsequently categorized by subsets of literacy and reexamined. Each time, the most current years were searched for new articles and inclusion in the review was not limited to empirical research. The first skill identified for further analysis was reading comprehension (Luckner & Handley, 2008), and the second was vocabulary (Luckner & Cooke, 2010). Even with the expanded criteria for review, each new look at the literature continued to support the initial findings; there is very little research to support practices used with deaf students.

Easterbrooks has contributed two literature reviews on evidence-based practices (2005; Easterbrooks, Stephenson, & Mertens, 2006). The focus of the

first was literacy practices. She started by identifying recommended instructional practices and then sought out the research to support them. Her findings mirrored that of Luckner, et al., (2005/2006) in that very little empirical research was found and many practices had no research base at all. In the second, Easterbrooks et al. (2006) identified 10 literacy and 10 math and science practices that were recommended. Some of the literacy topics overlapped with her earlier report. The conclusion was the same; many of the practices used with deaf students were not supported by empirical evidence.

Since these reviews, research in the field has been more geared toward identifying what works and what does not. Early intervention and literacy have received a lot of attention. Unfortunately, language development has not. There continues to be a paucity of research to support language facilitation strategies with children with hearing loss (Marschark, 2001).

Languages and Communication Systems

The language and communication of children and adults with hearing loss is best represented by a continuum. On one side, there is American Sign Language (ASL) (considered a “natural” language), and on the other side is Spoken English. In the middle there are a myriad of combinations. Invented sign systems for communication began to emerge starting in the 1950s. Methods have ranged from spelling each word out with the manual alphabet (Rochester Method), invented signs to represent English grammar and syntax (Signing Exact English, Seeing Essential English), and handshapes to represent the English phonemes produced around the mouth paired with speech (Cued Speech)

(originally created to teach literacy, but now used as a communication method) (Easterbrooks & Baker, 2002) (Appendix A provides a summary of the communication systems commonly used with students with hearing loss). Over the years, the different English systems and ASL have enjoyed moments of favor (Coryell & Holcomb, 1997), but the educational outcomes of students with hearing loss have remained relatively constant. This is clearly illustrated by two studies that were conducted to obtain normative data on the language of children with hearing loss. Pinter and Paterson conducted the first study in 1916. After testing over 500 students of all ages from two schools for the deaf, they determined that the children were plateauing at a third to fourth grade reading level. Eighty-four years later, Traxler (2000) obtained the same results from a sample of almost 5000 students from across the country. This delay in academic achievement is widely attributed to the lack of a fully developed language, whether it be signed or spoken (Easterbrooks & Baker, 2002; Kretschmer & Kretschmer, 1990).

Language Learning

Language is learned most effectively through natural conversation that is centered on the child's interest and involves turn-taking with adults (Spencer, 2003). When a child with normal hearing is born into a hearing family, language develops effortlessly. There is unimpeded access to language. When a child with hearing loss is born into a hearing family, the natural interactions between caregiver and infant are disrupted by the child's inability to access the spoken communication (McAnally, Rose & Quigley, 1999). This can cause a disturbance

in the natural development of language and can cause delay. The extent to which language development is affected is influenced by the level of hearing loss, the age at which the loss is identified, and receipt of early intervention services (Vohr et al., 2012).

Hearing Loss

Hearing loss can occur for a number of different reasons. It can be present at birth, called congenital, or can be acquired, such as that which results from disease or age. It can be caused by malformation or absence of the structures of the ear, or by damage. Knowing the cause of a hearing loss is important in understanding the potential for or type of intervention appropriate, and for understanding the potential impact of the loss (Johnson, Benson & Seaton, 1997). For example, the needs of a child who was born deaf may be different from those of a child who lost hearing due to disease after developing language. The following sections provide an explanation of characteristics used in describing hearing loss and the potential impact of different levels of loss on linguistic development.

Types. There are three types of hearing loss: conductive, sensorineural, and mixed (Martin & Clark, 2000), and it may occur in one or both ears.

Conductive hearing loss occurs when there is a structural malformation in the middle or outer ear, or an obstruction to the acoustic signal. Sensorineural is when there is a problem with the inner ear (the cochlea) or the auditory nerve, but the middle and outside structures of the ear are correct. A mixed hearing loss is when there are both conductive and sensorineural components.

Levels of hearing loss. Hearing loss is described based on the softest sound that a person can hear at each frequency (Katz, Medwetsky, Burkard, & Hood, 2009). When pure tone averages are reported, they are typically an average of the decibel thresholds for 500, 1000 and 2000 Hz. Table 1 provides these ranges. Also, see Appendix B for a picture audiogram that shows the different decibel levels and Hertz ranges for common sounds.

Table 1

Levels of Hearing Loss

Pure Tone Average (dB)	Degree of Loss
-10 to 15	Normal
16 to 25	Slight
26 to 40	Mild
41 to 55	Moderate
56 to 70	Moderately severe
71 to 90	Profound

Note. Adapted from <http://www.asha.org>

Effects of hearing loss. Approximately 3 to 4 percent of children with hearing loss are born to deaf parents (Mitchell & Karchmer, 2004). This means that the majority of deaf children will be born into families where they will not have automatic access to language. Other areas of development can be affected by a hearing loss and are related to the lack or underdevelopment of language. A selection of a chart titled "Relationship of Degree of Longterm

Hearing Loss to Psychosocial Impact and Education Needs” that applies to the current study is provided in Table 2.

Table 2

Effects of Hearing Loss

Level of loss	Impact on Language Development
Mild	<p>May miss 25-40% of the speech signal Will miss unemphasized words and consonants Often experiences difficulty learning early reading skills such as letter/sound associations. Child's ability to understand and succeed in the classroom will be substantially diminished by speaker distance and background noise, especially in the elementary grades.</p>
Moderate	<p>The amount of speech signal missed can be 50% or more with 40 dB loss and 80% or more with 50 dB loss. Even with hearing aids, child can "hear" but may miss much of what is said if classroom is noisy or reverberant. Addition of a visual communication system to supplement audition may be indicated, especially if language delays and/or additional disabilities are present.</p>
Moderately severe	<p>Without amplification, conversation must be very loud to be understood; a 55 dB loss can cause a child to miss up to 100% of speech information without functioning amplification. Addition of visual communication system often indicated if language delays and/or additional disabilities are present. Even with hearing aids, child will typically be aware of people talking around him/her, but will miss parts of words said resulting in difficulty in situations requiring verbal communication (both one-to-one and in groups).</p>
Profound	<p>Even with hearing aids children with 71-90 dB loss are typically unable to perceive all high pitch speech sounds sufficiently to discriminate them, especially without the use of FM. The child with hearing loss greater than 70 dB may be a candidate for cochlear implant(s) and the child with hearing loss greater than 90 dB will not be able to perceive most speech sounds with traditional hearing aids. For full access to language to be available visually through sign language or cued speech, family members must be involved in child's communication mode from a very young age</p>

Note. Reprinted in part from "Relationship of Degree of Longterm Hearing Loss to Psychosocial Impact and Education Needs" from the Educational Audiology Association. No copyright.

Education

It is not uncommon for deaf students to enter school with little to no language (Mohay, 2000) due to the lack of access at home, although exact numbers are not known (Mayberry, 2010). It is for this reason that it is widely accepted in the field of deaf education that language development is the critical area of focus (Easterbrooks & Baker, 2002; Kretschmer & Kretschmer, 1995; Miller & Luckner, 1992; Pinter & Paterson, 1916). Teachers of the Deaf become responsible for language development under these conditions and must use strategies to support it within the classroom. Language is the foundation for literacy, and literacy in turn fosters academic achievement and has implications for fulfillment in post-secondary life (Howell & Luckner, 2003; Marschark, 2001). Also, cognitive, social/emotional and academic growth depends on a child's ability to interact with his or her environment (Bailes, Erting, Erting, & Thumann-Prezioso, 2009). Despite the focus on language development that has existed since the inception of deaf education, students with hearing loss are continuing to achieve at an academic level that is not commensurate with their hearing peers (Kretschmer & Kretschmer, 1990; Marschark, Spencer, Adams & Sapere, 2011; Pinter & Paterson, 1916; Traxler, 2000). One factor may be language development.

Statement of the Problem

Upon entering school, many students with hearing loss have the challenge of learning two languages (ASL and English) and content material at the same time. The delayed language of the student is compounded by the increased

demand on cognition. It is a heavy burden for the child and for the teacher, especially under the current educational pressures that mandate that all children perform at grade level (e.g., requirements of the No Child Left Behind Act of 2001). Facilitating the language development of children with hearing loss in the classroom becomes a central issue for the academic success of the student (Howell & Luckner, 2003).

This focus on language development has been accepted for decades, yet we do not know exactly what teachers of the deaf are doing (Knoors & Hermans, 2010). A simple Google search of the term “facilitating language development” will yield a plethora of sites that explain things that parents can do to help their child without disabilities develop language. They include simplifying speech, asking questions, following the child’s lead, and encouraging conversation. It took an exhaustive review of literature within deafness to come across any such list. There are strategies that are recommended for use with children with hearing loss, but they are either geared toward developing speech, or are class activities for supporting English grammar and syntax instruction. For example, Miller and Luckner (1992) suggest that students be allowed to talk and recommend activities such as chats, scenarios (role-playing) and interviewing. Gustafson and Dobkowski (1995) also recommend talking and suggest some of the same activities. Various researchers have explored the role of dialogue within the classroom (e.g., Hartman, 1996; Kretschmer & Kretschmer, 1994, 1995; Mayer, Akamatsu & Stewart, 2002). These recommendations are also found within many deaf education textbooks. Stone (1988) outlined the program

used at an oral school for the deaf that is based largely on what he calls scenarios. They are essentially role-playing activities that the teacher creates to help the student discover the lesson objective. Easterbrooks and Baker (2002) recommend a variety of activities, which include authentic experiences, role-playing and storytelling. All of these activities are instructional activities that focus on a lesson objective, rather than on communication, and the research support for each varies.

One article was found that had strategies that an adult can do to facilitate the language development of deaf children, similar to what is found within the hearing literature (Luetke-Stahlman, 1993). Included are recasts, expansions, following the lead of the child, expatiations, self-talk, parallel-talk and paraphrasing. These strategies are presented as research-based, but the research was not done with children with hearing loss. This list served as the starting point for this dissertation. After many citation searches, articles were finally located that studied recasting, extensions, responsivity (following the lead of the child and encouraging communication) and self-talk/parallel-talk with deaf children. The research is old and limited, but the presence of any research at all serves as the basis for why they were selected as the foundation for this study. The fact that these strategies are so widely accepted for use with typically developing children, but have not received attention within a population that is most commonly described as language delayed, is puzzling.

To begin to understand why children with hearing loss are not experiencing greater academic achievement, we must first understand what is

actually happening in the classroom (Marschark et al., 2011; Woolsey, Harrison & Gardner, 2004). If teachers of the deaf are not using facilitation strategies, it may account for part of the persistent language delays seen in children with hearing loss. The purpose of this study was to identify the extent to which teachers of the deaf report using strategies that have been recommended to facilitate language development in children with hearing loss.

Research Questions

- Q1 To what extent do teachers of the deaf report using strategies that have been recommended for facilitating the development of language in children with hearing loss?
- Q2 Are there differences in the reports of teachers of the deaf based on years of experience, education, grade level taught, or communication modality used?

Significance of the study

Language is directly related to literacy, which all academic achievement is based on. It has been theorized that the oft quoted ceiling of fourth grade reading level for children with hearing loss is strongly influenced by language proficiency (Kretschmer & Kretschmer, 1995; Pinter & Paterson, 1916; Sticht, 2002). To date, there is little research regarding the effectiveness of language facilitation strategies with children who have hearing loss (Knoors & Hermans, 2010; Marlatt, 2001; Raver et al., 2012; Singleton & Morgan, 2006). Techniques have been recommended for use with children with hearing loss largely based on their effectiveness with typically developing children (Singleton & Morgan, 2006) or based on the experience of researchers (Easterbrooks, 2008), and we do not know if these techniques are even being used (Knoors & Hermans, 2010). This

study is intended to be a first step in identifying language facilitation strategies being used with children with hearing loss. If these strategies are not being used, it may account for some of the continued linguistic delays that children with hearing loss experience after beginning school. If they are actually being used, then their effectiveness with this population may need to be reevaluated.

Summary

Deaf students often enter school with delayed language. Literacy levels for deaf students have long been below their hearing peers and have been attributed to their lack of age-appropriate language. This has remained constant since the beginning of deaf education. An avenue of inquiry that has yet to be pursued is to describe what teachers of the deaf are doing to facilitate language development in the classroom. This information will lend itself to further investigation into the need for training in this area or for the need to explore different strategies.

CHAPTER II

REVIEW OF LITERATURE

One of the wondrous things about being human is having language (Goldin-Meadow & Mylander, 1990; Stredler-Brown, 2010). With it, we can express our wants, needs, and desires. We forge relationships, expand our knowledge, and reach across continents. Most children are born into language (Gioia, 2001; Meier & Newport, 1990). Infants, who have been hearing their mothers' voice for months, now see her smiling face and that of other family and friends. They are surrounded by language and engaged in communication with words, touch, and eye contact (Harris, 2010; Marschark, 1993). Out of these simple beginnings, the world opens up to them. The typical child in this environment will acquire language with little or no effort following a predictable sequence (Mayberry, 2010; Steinberg, 2000). For a child with a hearing loss, language development is not always so automatic.

This chapter will begin with an overview of the stages of language development for children with normal hearing, for children with hearing loss, and will then discuss challenges children with hearing loss face. The literature reviewed in this chapter will illustrate the current state of language learning among children with hearing loss and will offer a rationale for the importance of

what teachers of the deaf do in their classrooms to support language development.

Great care has been taken to avoid the debate described in Chapter 1 regarding speech versus sign language. As mentioned, that debate has been going strong since the 1700s and many authors have covered the merits of each side. There is no evidence, to date, that clearly indicates one modality being better than the other (Marschark, 2001). The intent of this literature review is to maintain focus on language as a universal human construct and not to make a case for one modality or another. The issues and strategies discussed apply to children who are developing spoken language and to those who are developing sign language. The goal of this investigation is to facilitate a better understanding of what teachers of the deaf can do to promote normal language development in students who have a hearing loss, regardless of the modality used.

Language

In order to begin to discuss the language development of children who are deaf or hard of hearing, it is important to understand the difference between *language, communication and speech*. *Language* can be defined as “a code whereby ideas about the world are expressed through a conventional system of arbitrary signals for communication” (Lahey, 1988, p.2). For example, the word “cat” is the code in English for a four-legged animal that has pointy ears, a long tail and meows. It is understood by most speakers of English, making it conventional, and it is used to communicate thoughts or ideas. It is arbitrary in

that its meaning comes from the acceptance of the code by English speakers. It could just as easily have been called a “smoot.”

Communication is “the sharing of information or ideas” (Harris & Hodges, 1995, p. 36) and is not dependent upon language. Facial expressions, body movements, or tone of voice can convey information or ideas. For example, in the United States, the rolling of one’s eyes is commonly used to communicate that the listener is exasperated with or dismissive of what he or she has just heard. No words are used, but the message is loud and clear.

Speech is “a medium for transmitting language” (Harris & Hodges, 1995, p. 238). It is the method by which most people communicate most of the time. It is a system of sounds that are used in particular sequences to convey specific codes for communication.

Decoding the Literature

The literature related to the language of children who are deaf or hard of hearing can be somewhat confusing and difficult to sort out due to a lack of consistent use of the terms *language*, *speech* and *communication*. The term “language” is often used to mean the ability to sign or speak and the ability to express one’s thoughts. These two concepts are often studied together, which confounds the results. For example, there are studies that look at the lexical, semantic, grammatical, and pragmatic uses of English and of American Sign Language (ASL), but they often rely on the child’s ability to express him or herself in one or both languages/modalities to test the hypothesis (Gregory & Hindley, 1996; Quigley & Paul, 1984). Studies that have looked at the spoken language

abilities of children with hearing loss have focused on the child's ability to correctly produce speech sounds, rather than his or her mastery of language (Marschark, 2001).

Children with hearing loss are a heterogeneous group. Variables such as age of identification, early intervention services, age at onset of early intervention services, level of hearing loss, hearing status of the parents, level of parental involvement, and communication modality all contribute to the unique abilities of each deaf child (Vernon & Andrews, 1990). There is a tendency within education to try to normalize or standardize so that performance and progress can be measured. The extent of the differences that exist within the population of deaf children make that very difficult to do (Muma & Teller, 2001). When there is an attempt to control for variables, the sample size often diminishes beyond the point of generalizability (Marschark, 2001). This directly challenges the ability of researchers to design and conduct empirically-based investigations (Anderson & Reilly, 2002).

Stages of Language Development

The following sections will outline the typical sequence of language development of children who do not have any disabilities. Subsequent sections will draw comparisons between this typical development and the development of children who have a hearing loss.

Children who have Normal Hearing

When a child with normal hearing is born to hearing parents, language will usually develop in a typical sequence. This sequence is broken down into stages

that encompass major linguistic milestones and are offered as ranges that represent when the majority of children will acquire each skill (Fischer & Lazerson, 1984). These stages are preverbal/prelinguistic, single-word, two-word, three-word/multiword, refinement/expanded, and complex.

Preverbal/prelinguistic. During the preverbal/prelinguistic stage, development is related to phonology. Through vocal play, infants are beginning to develop control over the sounds that they will later put together to form words (Iverson & Kuhl, 1995). The first vocalizations of newborns are cooing. They are typically vowel-like and are described as “squeals,” “growls,” or “raspberries” (Oller, 2006). Within just a few weeks, these sounds develop into distinctive cries to communicate different needs. Infants during this time are soothed by calm voices, and will become quiet and listen intently to new ones. They will also begin to localize to voices by turning their head toward the person who is speaking to them (American Speech-Language-Hearing Association (ASHA), 2006; Easterbrooks & Baker, 2002). Receptively, newborns are already able to distinguish the individual sounds used in speech (Eimas, Siqueland, Jusczyk & Vigorito, 1971; Iverson & Kuhl, 1995), and by about 2-3 months, will begin to smile socially in response to caregivers (Santrock, 1989).

In the latter half of the first stage, 6 to 12 months, infants begin to participate in vocal games where they imitate the intonation and speech sounds of an adult. Between 8 and 10 months, the character of infant babbling changes and becomes what is referred to as canonical babbling (Oller & Eilers, 1988). This type of babbling is the repetition of consonant-vowel combinations (e.g.,

/dada/, /mama/) and usually signals that the child has reached an understanding of meaningful speech and intentional communication begins to emerge (ASHA, 2006). By the time infants near 12 months of age, their vocalizations begin to have adult-like intonation (Masataka, 2006), and they will use jargon (Easterbrooks & Baker, 2002). These two skills result in strings of sounds that copy adult speech but are not, in fact, words. Infants during this time are able to follow simple commands or requests that involve familiar objects and routines, and to respond to their names.

Single word. Most infants utter their first true word at 12 months old, signaling the beginning of the single-word stage. During the next 6 months, between the ages of 12 and 18 months, they begin to rely heavily on deictic gesturing to get their point across and may develop their own words for things (Smiley & Goldstein, 1998). For example, a child may consistently say “wawa” for water or “bow wow” for dog. Toddlers during this time will have also learned to express the concept of “more,” and can easily follow one-step directions. The majority of words expressed are nouns and concepts that are immediate to the child (e.g., dog, hot) (Fischer & Lazerson, 1984)

Two-word. Between the ages of 18 and 24 months, toddlers enter into the two-word stage. Most of their vocalizations are still jargon and are not easily understood (Easterbrooks & Baker, 2002), but they can ask and answer simple what and where questions, and they enjoy shared “reading,” pointing to pictures in books and labeling objects (ASHA, 2006). Words that they do have command of tend to be used for multiple things. This is referred to as overgeneralization

(Fischer & Lazerson, 1984). For example, “doggie” may be a dog, cat, and a cow, or any animal with four legs.

Three-word/multiword. In the three-word/multiword stage between the ages of 24 and 42 months, the toddler’s language development, especially in the area of vocabulary, progresses rapidly (Easterbrooks & Baker, 2002). They enjoy “reading” the same book, or hearing the same rhyme or song repeatedly as they continue to sort out the complexities of speech and language (ASHA, 2006). They can talk about events from the past and follow multistep directions (ASHA, 2006). Children in this stage can carry on a conversation about past and future events. They begin to use adjectives and most of their speech, while still very simple, is mostly grammatically correct. Basic concepts, such as big/little, are within their understanding, and they are starting to use this knowledge in their own expressions (Easterbrooks & Baker, 2002). They begin to understand and use “why” (Brandone, Salkind, Golinkoff & Hirsh-Pasek, 2006).

Refinement/expanded. The refinement/expanded stage occurs between the ages of 3 and 4 years. During this stage, children continue to figure out the rules of grammar and morphology. They are using “what?” and “where?” questions extensively and are fine-tuning skills from earlier stages (Easterbrooks & Baker, 2002). They begin to use pronouns and articles, and the prepositions “on” and “in” (Williamson, 2008). Their speech is intelligible to most listeners and they are interested in having conversations (Bowen, 2012).

Complex. The complex stage is from 4 years on. Children’s language by this time is very adult-like. They are now able to use a variety of sentence

structures and can form a variety of novel expressions. They have language to talk about everything within the realm of their own experiences. They have mastered most of the syntax of adult speech, including irregular verb tenses. They enjoy making up stories and using their imaginations, and will engage in lengthy conversations. They develop figurative language, and continue to grow their vocabulary and conceptual understanding through the school experience (Easterbrooks & Baker, 2002; Kretschmer & Kretschmer, 1978).

Children Who Are Deaf or Hard Of Hearing and Learning ASL

Parents of children with hearing loss may choose to have their child learn ASL as their first language. This learning experience will be different for the child depending upon whether or not the parents are also deaf and ASL users.

Deaf children with deaf parents. When a child with a hearing loss has the opportunity to learn sign language naturally from his or her parents, it follows the typical progression as that of hearing children with hearing parents (Anderson & Reilly, 2002; Easterbrooks & Baker, 2002; Meier & Newport, 1990; Spencer & Lederberg, 1997). Drawing upon the stages of language development laid out above, one of the first major milestones for language development is canonical babbling.

Canonical babbling. Canonical babbling usually appears between 8 to 10 months of age in hearing infants and is signaled by vocalizations that begin to sound speech-like, with /mama/ and /dada/ being common consonant-vowel combinations. As canonical babbling has been found to be related to spoken language development (Oller & Eilers, 1988), the question arose as to the role it

plays in the language development of babies who are developing sign language. To investigate the presence of canonical babbling in the manual form, Petitto and Marentette (1991) compared the manual activities of two deaf infants with a control group of three hearing infants. The deaf infants were both learning ASL from their deaf parents. Activity samples were taken from each infant at three different ages: 10, 12, and 14 months. The hand movements of the infants were coded based on ASL linguistics (e.g., handshape, location) and its use (e.g., communicative, conventional ASL sign, holding an object). They found that the manual productions of the infants fell into two categories: gestures and manual babbling. Regarding gestures, the two groups produced a similar amount. However, when the productions were analyzed in terms of ASL phonology, they found that the deaf infants not only produced much more manual babbling (32-71% as compared to 4-15%), but that it conformed to the same descriptive requirements placed on vocal babbling (e.g., exhibited a small number of combinations, reduplicated, did not have meaning). These findings support that manual babbling is related to linguistic development in sign language just as vocal babbling is in spoken English.

The authors only reported the percentage of manual babbling the hearing infants produced and did not indicate if there was any significance between the productions of the two groups or if it was likely due to chance. There are examples of gestures that could be interpreted as signs or sign approximations that could account for the apparent presence of manual babbling in hearing infants. One example is the opening and closing of one's hand (the ASL sign for

MILK) and putting a hand to one's mouth as if drinking (the ASL sign for DRINK) (Volterra, Iverson, & Castrataro, 2006). Infants are born with a reflexive ability to grasp things, especially when they are neonates (Santrock, 1989). Older infants may have learned to do this to say bye-bye, and one-year olds often use it to request items.

First sign. Another major developmental milestone for language is the first word. In hearing children, this usually happens at around 1 year of age. Anderson and Reilly (2002), in collecting data for a normative sample for the newly created MacArthur Communicative Development Inventory for American Sign Language (ASL-CDI), found two interesting results that paralleled the spoken English development of hearing children. Their sample was comprised of 69 deaf children between the ages of 8 and 36 months. All of the children were described as being deaf and having two deaf parents. Many of the families reported having additional family members who were deaf, and 96% reported using ASL as their primary language. The researchers collected data only from families where the child and the parents were deaf so as to obtain data from deaf children who were learning language naturally from their parents in an attempt to mirror the language-learning environment of most normally hearing children.

The first finding was that that the children in their sample were reported as having expressed their first sign by the age of 8 months, whereas hearing children typically say their first word at 12 months. This appears to suggest that children who are learning sign language as their first language have an advantage over those learning spoken language. Other researchers have

proposed possible reasons for this apparent sign advantage, suggesting that either the modality lends itself to earlier expression (i.e., the motor control of the hand vs. the motor control of the vocal mechanisms) (Anderson & Reilly, 2002; Meier & Newport, 1990; Orlansky & Bonvillian, 1985) or that credit was given to the child as having produced a sign when in fact it was a gesture (Petitto, 1988; Petitto & Marentette, 1991). As discussed previously, there are gestures that could be interpreted as ASL signs (e.g., MILK).

The second finding relates to lexicon. Anderson and Reilly (2002) compared the first 35 words that were reported as being used by at least 50% of the children from the ASL-CDI data and by at least 50 % of the children from the English version of the MacArthur Communicative Development Inventories (CDI) (Fenson et al, 1993) normative data. They found that first signs were very similar to first spoken words. Namely, nouns outnumbered verbs, and the actual words that were expressed reflected the objects and parts of a young child's life that are important, regardless of hearing status (e.g., dog, banana, cracker, milk/bottle, mommy, daddy, etc.). Differences between the two lists could be attributed to modality issues. For example, there is no sign equivalent for "woof" or "ouch" that appeared on the CDI list, and in ASL the body parts are identified by pointing to them, not with a signed label.

The norming data for the ASL-CDI provide a comprehensive set of data regarding the language development of deaf children who are learning ASL from their deaf parents. These results show, not only that when children with hearing loss have an opportunity to develop language naturally from their parents, in the

absence of other disabilities, they will, but also that the way the language will develop is very similar to how it develops in hearing children.

Deaf children with hearing parents. Some hearing parents, upon learning of their child's hearing loss, will begin to learn sign language. Ironically, even though this represents the family situation of most deaf children (Mitchell & Karchmer, 2004), we have almost no information about their progress (Spencer, 1993). Spencer (2006) conducted a study to look at how the efforts of hearing mothers to learn sign language affected the language development of their children. Sixty-eight mother-child dyads participated and were divided into four groups: hearing mother-deaf child (Hd; $s=18$), hearing mother-hearing child (Hh; $s=18$), deaf mother-deaf child (Dd; $s=16$), deaf mother-hearing child (Dh; $s=16$). All of the children in the Hd group had a hearing loss in the moderate to profound range (i.e., greater than 40 dB), were identified as having a hearing loss before the age of 6 months, and had begun receiving early intervention services before the age of 9 months. All of the deaf mothers reported using ASL to communicate with their children. The level of hearing loss for the Dd and Dh groups is reported for the mothers and children together, and is described as being from mild to profound (i.e., 20- >110 dB), with most of the children falling in the severe-profound to profound range (i.e., greater than 75 dB). Each dyad was videotaped during free-play sessions with the same set of toys. At 12 months of age, they were recorded for 15 minutes, and when the children were 18 months of age, they were recorded for 20 minutes. The videos were then analyzed to identify communication behaviors exhibited by the mothers, including spoken or

signed language and informal communication. The children's communication behaviors were coded similarly, with the addition of the category of communicative intent. Additional data were collected via interviews with the mothers when their children were 9, 12, 15, and 18 months old.

Regarding the question of how the signing of a non-fluent, hearing mother affects the language of her child, Spencer (2006) found that the vocabulary of the children in the Hd group was less developed than the children in the other three groups. This may at first seem quite disappointing. However, when the performance of the children in the Hd group is looked at descriptively, 6 children (33.3%) reached the single word/sign stage at 18 months old. Six (37.5%) of the children in the Dd group and 8 (44.4%) of the children in the Hh group also performed at that level. Therefore, while the majority of children in the Hd group had not moved beyond the prelinguistic stage by 18 months, one-third of them did.

A subset of the Hd group was studied further to look at the effects of continued intervention that included sign language on the mothers' sign use and how their use of signs affected the language development of their child. Seven dyads were selected based on the families' participation in ongoing early intervention programs that included learning sign language. The original videos were re-coded for the use of signs; credit was given to the mothers if at least one aspect of the utterance was signed. At 12 months, two mothers produced no signs, two produced 5-8 signs, and three produced 25-51 signs during the 10 minute coding session (the first 5 minutes was considered a warm-up time and

was not coded). At 18 months, one mother did not produce any signs (one of the two who did not sign at the 12-month mark) and the other six produced 9-57 signs. Even though all the families received a similar amount of intervention services, there was a high degree of variability in the effect of those services.

The children whose mothers signed the most during the two video sessions also themselves used the most signs during the 18-month video session. The sign production of the children in this subset was highly correlated to their mother's use of signs (12 months $r=.87$, $p < .05$; 18 months $r=.93$, $p<.01$), even though their mothers did not sign fluently and exhibited many errors.

These studies address the issue of deaf children who are learning sign language from their parents, either deaf or hearing. While it is clear that deaf children whose parents are fluent language models outperform those whose parents are not, it is important to understand that the issue is *access* to language. Even when the language model is not complete or is not perfect, children will and do develop language when they can hear or see it.

Children who are Deaf or Hard of Hearing and Learning Spoken English

For children with hearing loss who are developing spoken English, amplification is recommended (Nussbaum, Waddy-Smith, & Doyle, 2012; Yoder & Warren, 1999). Improved access to the auditory signal allows the child to better detect the speech sounds and to monitor his or her own speech production (Ackley & Decker, 2006). The two most common ways of doing this are through hearing aids (Gabbard & Schryer, 2003) and through cochlear implantation (Most, Rotham, & Luntz, 2009). Recent advancements in digital technology have

improved the quality of the signal produced by both of these devices and have enabled better programming to fit the individual needs of users (Ackley & Decker, 2006). Children with hearing loss who are developing spoken English have been found to progress along the same developmental sequence as hearing children, but at a slower pace (Blamey, Sarant, & Paatsch, 2006).

In one of the first studies to investigate the character of vocal babbling in deaf and hard of hearing infants, Oller and Eilers (1988) wanted to understand the role audition plays in babbling. Until then, the premise had been that, because the babbling of deaf and hearing infants was very similar, it must be merely physiological and not related to hearing. They compared the vocal productions of nine infants with hearing loss with that of 21 infants with normal hearing. All of the children with hearing loss had pure tone averages above 80dB and had begun hearing aid use between 1 and 13 months old. They found that all of the infants with normal hearing began canonical babbling between 6 and 10 months old, while the infants with hearing loss did not begin until 11 to 23 months old. The study provided support that infants who receive amplification early can progress through the typical developmental stages, and that infants are actively practicing what they are hearing.

A three-year study that followed the language development of 87 children with hearing loss in Australia also showed a slower progression along the typical sequence (Blamey et al., 2001). All of the children were between the ages of 4 and 12 years old when the study began, used either a cochlear implant or hearing aids (or both), had pure tone averages above 40dB and were learning spoken

English with no sign support. Each year, each child was assessed with the Peabody Picture Vocabulary Test (version III or R, hearing norms) (Dunn & Dunn, 1981), the Clinical Evaluation of Language Fundamentals (version Preschool or 3, hearing norms) (Semel, Wilig, Secord, 1992) and through a conversational sample of 60-70 utterances in a 15 minute period. The children in both the cochlear implant and hearing aid groups developed language at a rate of one-half to two-thirds the rate of normally hearing children.

Geers, Moog, Biedenstein, Brenner and Hayes (2009) conducted a large study that included 153 children with hearing loss from 39 states. All of the children were between the ages of 5 years and 6 years 11 months, had been identified as having a profound hearing loss before the age of 20 months, had received a cochlear implant before the age of 5 years, had received early intervention services, and were enrolled in programs that did not use any sign language. A variety of measures were used to test receptive language, expressive language, spoken language and cognitive ability. About half of the children in this study performed comparably to hearing peers in the areas of receptive vocabulary, expressive vocabulary, and receptive language. A significant relationship was found between age of implantation and language performance; the earlier a child had been implanted, the better his or her language.

The successes of the children in these studies demonstrate that early access to language via the auditory channel can make a large impact on language development. Children will reach early milestones, such as babbling,

and will continue to progress through the stages of normal language development. An important aspect here is that, not only were these children given access early, but also they and their families participated in early intervention programs.

Early Intervention

Based on an analysis of available data sets conducted by Mitchell and Karchmer (2004), it is estimated that only 3 to 4 percent of deaf children are born to deaf parents. This means that the majority of deaf children will need some kind of intervention to access language, whether spoken or signed. Prior to early hearing detection and intervention (EHDI) programs, it was common for a child's hearing loss to go undiagnosed until the age of 2 to 3 years old (Gustason, 1989). Every state now has EHDI programs and most have laws regarding early identification of hearing loss (Center for Disease Control and Prevention (CDC), 2010). Most children are screened for hearing loss prior to leaving the hospital (Hoffman & Beauchaine, 2007), making the provision of intervention services at this young age possible.

Recently, studies have focused on the spoken English development of children with hearing loss in relation to the age of identification/amplification and to the influence of early intervention services. In doing so, there is now evidence to support that children who receive services early are displaying language development gains that approach that of hearing children. Research has narrowed that down to indicate that children who receive intervention before the age of 6 months show substantially more linguistic gains than those who receive

intervention services after 6 months (Moeller, 2000; Yoshinaga-Itano, Sedey, Coulter, & Mehl, 1998). Intervention services can be in the form of direct therapy with the child, or can be family-focused where a parent advisor teaches parents and siblings how to adjust their communication to make it more meaningful to the child and how to facilitate language development (Muma & Perigoe, 2010; Watson, 2004).

Sedey and Yoshinaga-Itano (2008) analyzed the speech and language development of 122 deaf children between the ages of 4 and 7 years who had received early intervention services in Colorado. The children had bilateral hearing loss ranging between mild and profound, used a variety of communication modalities, and had all begun receiving early intervention services before the age of 8.5 months. Their expressive and receptive vocabulary, grammatical comprehension, and speech production and intelligibility were assessed at the time of their birthdays, between one to four times for each child (i.e., over one to four years). All of the children had English-speaking, hearing parents and had cognitive functioning within the average range. The children sampled in this study demonstrated vocabulary comprehension comparable to hearing peers at all age levels. Regarding grammatical comprehension, the children between the age of 4 and 5 performed at expected levels, while the children in the 5 to 6 year group were delayed five to seven months. For expressive vocabulary, all age groups were delayed six to eight months, but were gaining one year's growth in one year.

These results appear to indicate that early intervention is allowing some children to enter school with age appropriate language. The early intervention program in Colorado is a model program offering comprehensive services to families. Many states have not developed their early intervention programs for deaf children to this level (Sass-Lehrer, 2011). Additionally, even after receiving these services, the children in the older groups were exhibiting delays. It leaves us with the question of why language and academic levels are below expected levels for older children with hearing loss (Anderson & Reilly, 2002; Mayberry, 2010; Mohay, 2000). One key note here is that approximately 75% of the children were placed in special education classes for preschool, however, for kindergarten, approximately 90% were being educated in the general education setting. This change in placement would mean a higher student to teacher ratio and less direct services from a teacher of the deaf. It could be that the decreased level of special education support once entering kindergarten had a severe impact on linguistic performance.

Early identification and intervention services have been shown to have a positive impact on the language development of deaf children (Yoshinaga-Itano, 2003). While this helps to mediate the issue of access to communication and language, it does not ameliorate the effects of the hearing loss (Easterbrooks & Baker, 2002; Spencer & Marschark, 2010). We do not yet know exactly what it is about early intervention services that is promoting success. As with many aspects of the research in deafness, the focus tends to be on which language

modality may be more advantageous (sign versus speech), rather than on the effects of any specific strategies (Spencer & Marschark, 2010).

Language Development In School-aged Children Who Are Deaf or Hard of Hearing

When a young child has not had the opportunity to acquire language naturally, more than just language development is affected. For example, Iverson and Braddock (2011) compared the motor development of a group of 11 preschool children who were exhibiting language delay with an age-matched group who were not exhibiting language delay by measuring their use of gestures and their motor skills. The cause of the language delay in the children was unidentified and there were no other known disabilities. They found that the children who had delays in language also had significant delays in fine and gross motor skills and used gestures more often to communicate. Presumably these children are experiencing natural language exchanges that is a different situation than what most deaf children experience. However, this research supports the notion that language does not develop in isolation from other areas.

Language is the tool that we use to understand and interact with our world (Ramsey, 1997). While most deaf children have similar experiences as hearing children (e.g., daily hygiene, going to the grocery store, setting the dinner table), they do not get the language that goes along with it (Rose, McAnally, & Quigley, 2004; Spencer & Marschark, 2010). Construct learning such as that which comes from storytelling and exchanges around books, retellings of shared experiences, and incidental learning opportunities are limited or completely missed (Bailes et al., 2009). These activities are the building blocks of language,

and create bonding and self-confidence (Plessow-Wolfson & Epstein, 2005; Robertson, Dow & Hainzinger, 2006), build background knowledge and reinforce concepts (e.g., time), and foster reading enjoyment (Maxwell, 1984; Steinberg, 2000). All of these activities influence skills that are required for literacy and school learning (Luckner & Cooke, 2010; Mahshie, Moseley, Scott & Lee, 2005) and are dependent upon having command of a language (English or ASL) (Streng, Kretschmer & Kretschmer, 1978). Using shared reading as an example, in a meta-analysis of 29 available studies conducted with hearing preschoolers and their parents, Bus, van IJzendoorn, and Pellegrini (1995) found that shared book reading has a positive effect on the language growth, emergent literacy, and later reading achievement of children. Their findings support earlier research indicating that shared reading gives the young child an understanding of the printed word that is then used in reading comprehension.

Luckner, Slike, and Johnson (2012) identified five areas that present a challenge for the academic success of deaf children: language, vocabulary and literacy delays; gaps in background and domain knowledge; inadequate knowledge and use of learning strategies; social skills deficits; and reliance on assistive technology. Of these, the first four are all related to language acquisition and skills that are gained from natural interactions between children and their caregivers, such as shared reading and general conversation. When a child does not have the opportunity to develop these skills, he or she enters school unprepared for academic learning and at a disadvantage compared to hearing peers.

The typical hearing child begins school with a fully developed functional language, and formal education in elementary school serves to foster the continued mastery and sophistication of that language (Quigley & Paul, 1984). A child with a hearing loss often experiences complete language input for the first time upon entering school (Luetke-Stahlman & Luckner, 1991; Ramsey, 1997). Beginning school without a fully developed functional language presents a child with a daunting challenge. In the United States, he or she must begin or continue to develop language (English or ASL, spoken or signed), learn to read and write in English (Andrews & Rusher, 2010), learn new ways to think and process information, and master content all at the same time (Easterbrooks, 2010; Easterbrooks & Baker, 2002; Knoors & Hermans, 2010; Luckner et al., 2005/2006; Mahshie et al., 2005; Mayberry, 2010). Research with hearing children suggests that if literacy-related skills are delayed upon entering school, the delays are likely to persist (Lonigan, Burgess & Anthony, 2000). It is for these reasons that the priority of the teacher of the deaf must be to facilitate the development of language of the deaf child (Easterbrooks & Baker, 2002).

Priority is Language

To say that language delay is the major obstacle for deaf children, and therefore language development is the priority of teachers of the deaf, is an oversimplification of the issue. Language is woven into all areas of child development to varying degrees. Children who develop language early have been found to have greater literacy achievement, and literacy skill relates positively to academic achievement (Easterbrooks, 2008). As has been

discussed in previous sections, language is a social construct. It is our interaction with native or fluent users of a language regarding their own thoughts and feelings that teaches us how to formulate and express our own thoughts and feelings (Boothroyd & Gatty, 2012; Steinberg, 2000). During these exchanges, cognition and social development are fostered and, these, in turn, foster the acquisition of language (Greenberg, Calderon & Kusche, 1984; Luetke-Stahlman & Luckner, 1991; Spencer & Marschark, 2010; Teale & Sulzby, 1989). These skills are then put to the task of reading. Sticht (2002) explained this using a concept called “reading potential.” Based on the idea that spoken language is used to understand text, a person’s “reading potential” is defined as the level at which he or she can listen to and understand spoken language. It is then assumed that a person can attain literacy skills to the level of his or her spoken language abilities. Sticht stated that the reason for the emphasis on language development in the pre-school years is to develop “listening vocabulary and conceptual comprehension” that will increase a child’s “reading potential” (para. 2).

In 1916, Pinter and Paterson, two university professors, set forth to establish norms for the “language” of the deaf. Their rationale was that language is the most important thing a deaf child must learn, and that they must learn it in school because they are not exposed to a “language environment” at home. They included in the introduction a quote from a curriculum manual written by the then Superintendent of the Ohio Institution for the Deaf: “The prime object to be

held in view by every teacher, at all times, is to teach the pupils a correct and easy use of written English language” (p. 413).

The sample for this study consisted of 570 deaf students from the Ohio and Kentucky schools for the deaf, which included children who were being instructed using the oral method (lipreading and speech) and manual method (signs and fingerspelling), and all grade levels. They measured the children’s “language” using Completion-Test Language Scales (Trabue, 1916), a cloze test presenting twelve pairs of written English sentences with an open set of responses. In their analysis, they draw two conclusions that are particularly salient in this discussion: “The language development of hearing and deaf children proceeds in general along the same lines” and “The grade abilities of the majority of deaf children fall between 2 and 4. Very few deaf children (6.4 per cent) reach scores above the fourth-grade ability” (Pinter & Paterson, 1916, p. 436). Additionally, as commented previously, they used one language and modality to test another (i.e., “language” was the deaf children’s ability to read and write written English).

Despite advances in amplification, early intervention, changes in instructional methodology and mode of language input, the reading skills of deaf children as a group have continued to plateau at the fourth grade level (Spencer & Marschark, 2010; Traxler, 2000). It is startling to realize the extent to which things have not changed. If not for the style of writing in this 1916 article, one would think it was written today.

Legal Influence

The passage of the No Child Left Behind Act in 2001, which called for evidence-based practices to be used in education, has led to a need to examine the body of empirical research conducted with deaf children. This has been done with literacy research (Easterbrooks & Stephenson, 2006; Luckner et al., 2005/2006), with reading comprehension strategies (Luckner & Handley, 2008), with vocabulary (Luckner & Cooke, 2010), and with some math and science strategies (Easterbrooks & Stephenson, 2006). Within the area of language, it is difficult to synthesize study results (Gregory & Hindley, 1996). Is “language” spoken English? Fluency in ASL? Literacy (reading and writing English)? The reality is that for most children with hearing loss, learning “language” means learning all of these things. They are expected to be bimodal (speech and sign) and bilingual (spoken or written English and sign/ASL) (Power & Leigh, 2003). Many of the studies have focused on how oral or manual communication systems interact with English language learning, learning specific features of English (e.g., syntax, morphology, pragmatics, phonology, vocabulary), and child characteristics (e.g., age of identification, age of intervention, parental involvement) (Spencer & Marschark, 2010). Because there are so many variables, it is difficult to draw conclusions across studies (Beattie, 2006; Marschark, 2001). Additionally, there is a paucity of research on specific techniques used to facilitate language in school-aged deaf children (Singleton & Morgan, 2006). Much of the practices currently in use are based on recommendations made by experienced teachers and researchers

(Easterbrooks, 2008). The NCLB served as a catalyst for all areas of education to examine its data and reevaluate practices.

Standards for Teachers of the Deaf

The Council on the Education of the Deaf (CED) is a unifying organization comprised of seven national organizations that are all dedicated to the needs of children and adults who are deaf or hard of hearing. The mission of CED is to promote excellence in deaf education. As part of this mission, CED has developed knowledge and skill standards that are meant to ensure that teachers of the deaf are trained with the depth and breadth needed to accommodate the various needs of children with hearing loss, including both spoken and signed modalities. There are ten standards that address topics from basic background knowledge about deafness and deaf education, to ethics and collaboration.

In this list of knowledge and skills created by, arguably, the most knowledgeable people currently working in the field, the importance of language development is reflected. In the standard titled “Language,” emphasis is on teachers having a solid understanding of theory related to language development, of communication and of the aspects that effect language development. Four of the five skills under this standard are directly related to facilitating language development in both the spoken and signed modalities. Under the standard “Learning Environments/Social Interactions,” two of the five skills are related to interactions with fluent models and natural conversational exchanges. And finally, under the standard “Instructional Planning,” there is the

skill to build language teaching into content area lessons. These are presented in Table 3.

For at least the last hundred years, in the field of deaf education there has been a focus on developing the language of deaf students. The standards developed by the CED continue to stress the importance of this through the heavy concentration on knowledge and skills related to facilitating language development (see Appendix C for a list of all of the knowledge and skill standards).

Table 3

Council on the Education of the Deaf (CED) Standards

<i>Standard</i>	<i>Skill</i>
<i>Language</i>	Apply strategies to facilitate cognitive and communicative development. Facilitate independent communication in all contexts. Communicate proficiently in spoken language or the Sign Language indigenous to the Deaf community.
Learning Environments/Social Interactions	Provide access to incidental language experiences. Design a classroom environment that maximizes opportunities for visual and/or auditory learning and meets developmental and learning needs.
Instructional Planning	Integrate language instruction into academic areas.

Note. Retrieved from <http://councilondeafed.org/standards2.html>

Beliefs

Teacher beliefs are “implicit assumptions about students, learning, classrooms, and the subject matter to be taught” (Kagan, 1992, p. 66). They are

developed through the accumulation of personal experiences learning, practical experience teaching, the influences of the environment, and personality (Kindsvatter, Willen & Ishler, 1988). Current research supports that these beliefs play an important role in how teachers make decisions about their teaching (Parajes, 1992), making it important to understand exactly what a teacher's beliefs may be (Richards & Lockhart, 1994). If beliefs are the overriding system determining how decisions are made in the classroom, then this must be the avenue to ensuring that teacher practices are effective and research-based. However, to date, this is not an area of inquiry that has been pursued extensively within deaf education.

One study in deaf education looked at the literacy beliefs and practices of itinerant teachers of the deaf. The goal of the research was to lay the groundwork for further investigation into an effective delivery model for this type of educational support. Through a combination of interviews and observations, Reed (2003) was able to conclude that the 5 teachers in her sample exhibited congruence between their beliefs and their practices.

In another study from the field, Williams (1995) compared the literacy and language development beliefs of three preschool teachers of deaf children by collecting data through interview and observation. Although the three teachers taught in the same program, they each had distinctive ideas about language and literacy that were reflected in their practice. Elizabeth believed that her primary goal was to "increase language, speech and auditory skills" (p. 58), and her practice focused on teaching discrete skills. Denise's view of language differed

in that she believed that children needed to be engaged in conversation to stimulate language growth, but her practice also tended to be on teaching discrete skills. Anna differed from her colleagues. She believed that deaf children needed the opportunity to learn language the same way that hearing children do, just in a visual modality. She commented that she used the same techniques with her students that she used with her daughter and her major classroom practice was shared reading. Most of what these three teachers did in their classroom was reflected in their beliefs about language and literacy development.

Personal learning experiences and beliefs about what students can or cannot do are powerful aspects that affect the choices teachers make in instruction. Even when teacher preparation programs train students in best practices, it cannot be assumed that that is what they do when they get their own classroom. Explicit research must be undertaken to describe the teaching methods used with students who have hearing loss, and then to test the efficacy of those methods. There is a body of research that looks at beliefs on language development regarding second language learning from the perspective of the learner and of the teacher; however, within the field of deaf education, this aspect has not been explored (Garberoglio, Gobble, & Cawthon, 2012).

Conversation

“Conversations are dynamic, interactive forms of discourse in which two or more people attempt to construct, express, and share ideas and information along collaboratively established topics” (Gustafson & Dobkowski, 1995, p. 54).

As the basis of natural language learning, it is intuitive that this would be recommended as the structural framework for instruction of children with hearing loss. This is a reflection of the conditions that normally happen within a family when the members all have access to each other's language. The ability to converse and use language lends itself to literacy and academic achievement (Sticht, 2002).

Child-directed Speech

Researchers seeking to identify how language is learned have looked at the natural conversational exchanges between parents and their children. Adults respond to children in specific ways depending on their language development. This child-directed speech is often referred to as motherese or parentese (Bergeson-Dana, 2012). It is characterized in part by a slower rate of speech/sign, simplified expressions, exaggerations, a question-like intonation, and a longer response time (Harris, Clibbens, Chasin, & Tibbitts, 1989). Specific aspects of child-directed speech have been identified as influencing language development in children without disabilities and are the basis for recommendations for use with children who have hearing loss (Spencer, Bodner-Johnson & Gutfreund, 1992). All happen within the context of conversational exchanges.

Recommended Strategies Supported by Research

The following are facilitation strategies that have been recommended within the literature for use with deaf children. The majority of information was found in journal articles. An exhaustive review of textbooks focusing on hearing

loss and language development yielded very little regarding specific strategies that can be used to support language development (see Appendix D). The focus was on lesson planning and class activities that can be used to give experience. It is not known at this time if this is an indication of whether or not these strategies are being taught in teacher preparation programs.

Recasts

Recasts are restatements of a child's utterance that maintain the meaning of the utterance while either making an incomplete utterance a sentence or by saying the same thing in a different way (Fey, 1986; Kretschmer & Kretschmer, 1990; Luetke-Stahlman, 1993). For example, "Daddy goed?" is recast as, "Yes, Daddy left." And, "I no want any," becomes, "You don't want any?" This has been shown to be a natural part of conversation between children and their caregivers (Brown & Bellugi, 1964).

One of the first studies to confirm the relationship between adult recasts and child language development was done by Nelson, Carskaddon, and Bonvillian (1973). Previous research had identified the technique, but not controlled for other variables making it difficult to draw conclusions. In an attempt to correct this, Nelson et al. designed a study that included a control group and two intervention groups. Twenty-six children without any disabilities between the ages of 32 and 40 months old were selected from a university daycare. An attempt was made to make the sample as homogenous as possible based on age, mean length of utterance on language samples collected prior to the study, and ability to interact with the researchers. The children were then

randomly assigned to one of the three groups. The researchers met twice a week with each of the children in the intervention groups for 20 minutes over 13 weeks. During each session, the researcher responded to the child either with only recast or expanded sentences, or with one of five set responses meant to encourage conversation without providing any semantic correction (e.g., that really looks nice). Pre- and post-test descriptive data were used to measure the effect of the interventions on the children's' language complexity (e.g., mean length of utterance, noun phrases, verb usage). They found that while both intervention groups showed gains, the recast group outperformed both the new sentence and control groups with the greatest gains being in verb usage.

In follow up, Nelson (1977) designed a study to focus on the effects of recasting in facilitating the development of complex verbs (e.g., future tense, conditional tense, use of two verbs of same form in one sentence) and complex questions (e.g., tag questions, wh- negative questions), two of the categories analyzed in the previous study described above. Two groups of six children each were established based on their lack of evidence of the syntactic forms identified. They were all learning English as a first language, were without any known disabilities, and were 28-29 months old. Each group received one intervention and served as the control for the other group. Over two months, each child participated in five one-hour sessions where the researcher provided as many recasts as possible of the targeted structure. All of the children demonstrated acquisition of the targeted structure of their intervention, whereas only one child

in each group acquired the non-targeted structure during the intervention period. This provided more evidence of the role of recasting in development of syntax.

Prinz and Masin (1985) conducted a parallel study where the modality was sign language. The authors noted that previous studies had focused on describing the linguistic behaviors of deaf mothers with their deaf infants but had not applied experimental controls, and modeled their study after the Nelson (1977) study described above. Six participants were selected from a preschool program at a state school for the deaf that followed a Total Communication philosophy. They were between the ages of 9 months and 6 years 4 months, had congenital deafness in the severe-to- profound range with no other known disabilities, had parents who signed, and had not yet reached the two-word stage of language development. In this study, the teachers and parents delivered the intervention. They were trained on recasting the specific syntactic forms that had been identified for their child/student and kept a log of their interactions during the sessions. As each child was assigned a different syntactic form, they served as controls for each other. Syntactic forms targeted were: subject-verb relations, subject-verb-object relations, attribution, negation, conditions, attributions and conjunctions. Each mother and teacher lead two interventions sessions a week with the children for a total of four sessions a week for 30 minutes over five months. One session with the mother and one session with the teacher was video recorded each month. Pre- and post-intervention sessions were also recorded. The results indicated that each child demonstrated a more rapid acquisition of the targeted semantic form than children who did not receive the

targeted recasts. These results present evidence that recasting is effective with children with hearing loss and through the use of sign language.

Extensions, Expansions and Expatiations

Extensions or expansions are comments that are directly related to what the child has just said and add something that is related (Fey, 1986). Their purpose is to continue the conversation with the child and they are often used with recasts (Kretschmer & Kretschmer, 1990). For example, if a child says, “doggie blanket,” the recast could be, “The doggie is on the blanket,” and the extension could be, “She is cold.” In addition to continuing the conversation, it communicates to the child that what he or she is saying is important, allows the adult to check for understanding and reinforces the communication act itself (Rose et al., 2004). This supports language development in children who are developing normally, who have language disorders (Forrest & Elbert, 2001; Weiss, 2002), and who are from low socioeconomic homes (Pemberton & Watkins, 1987).

Expatiations are similar to expansions and extensions, but they add a new aspect to what the child has said or utilize new vocabulary (Fey, 1986; Luetke-Stahlman, 1993). Their purpose is also to continue the conversation. For example, if a child says, “Videos no working, Mommy?” the recast could be, “No, the videos aren’t working,” and the expatiation could be, “The videos won’t load. We don’t have an internet connection.”

One study was found where the use of expansions was tested with deaf children. In 1975, Scroggs measured the effect of teacher expansions on a

group of deaf preschool children. A preliminary study included five preschool teachers of the deaf in an oral summer program. They were trained in using expansions, then videotaped each week with their class. Expansions were defined as “a complete grammatical sentence that was an expansion of the child’s communication attempt” (p.351). No student information was provided. The videos were reviewed with them each week and a percentage of expansions was calculated by dividing the number of expansions possible with the number of expansions used. Their target was 50%, and communication attempts were defined as any attempt to communicate, including spoken and gestural/signed. After six weeks, all of the teachers were expanding at least 50% of the children’s communication attempts and the number of communication attempts made by the children had increased. Because these teacher-student groupings were not the same as during the normal school year, Scroggs determined that the teachers and students getting to know each other may have accounted for the increase in communication attempts. This part of the study, originally intended to be the actual study, became the preliminary study and she conducted a follow-up study. This may be the reason that she does not report student demographics for this portion of the investigation.

The follow-up study involved three teachers of the deaf from the same school. They were selected based on the student composition of their classes. All classes had been intact for at least four months. Data were collected over a baseline period of three weeks, after which the teachers were trained on the use of expansions. Class A had three students with a mean age of 6 years 9 months,

and each child had a pure tone average in the better ear of 66.7-78.3 dB and was developing “normally” (this was not defined). Class B had four students with a mean age of 6 years 7 months, and each child had a pure tone average in the better ear of 100+ -110+ dB and was developing normally. Finally, Class C had four students with a mean age of 7 years 7 months, and each child had a pure tone average in the better ear of 90-110+ dB and were exhibiting language and learning problems (not specified). Each teacher was videotaped twice per week for eight weeks during language instruction. A percentage of expanded communication attempts was calculated, as well as a communication rate of the students by counting oral and non-oral communication attempts made every three seconds.

In Class A, the teacher maintained an expansions rate of 66.88%, but the number of expandable communication attempts by the students decreased. Because the overall communication rate of the students increased, Scroggs deduced that the students were either using more correct language or their communications were longer. Additionally, she noted that the teacher’s use of expansion rose and fell together. In other words, the more expansions the teacher used, the more the students made oral and non-oral communication attempts, and the less he used them, the less the students attempted to communicate.

In Class B, the teacher only used expansions at a rate of 34.55%; however the students used more non-oral communication attempts. Scroggs (1975) speculated that this could have been due to the teacher expanding the

non-oral communication attempts at a higher rate than the oral communication attempts. She also noted the same trend in expansions used and communication attempts made as in Class A. In neither case could the causal direction be determined.

In Class C, the teacher maintained an expansions rate of 79.16%. The students in this class showed an increase in communication rate from 3.9 per minute during the baseline period to 5.24 per minute during the intervention period. Almost all of the communications during the intervention phase were non-oral, and the rate of oral communications decreased from baseline to intervention periods. The same trend of parallel movement between percentage of expansions used and rate of communication was not apparent in this class; however the rate of communications for these students increased substantially.

Even though there are two separate results from this study, Classes A and B, and Class C, both indicate that the use of expansions by the teacher had a positive effect on the communication of the students. Even though no measurement of language development was taken and, therefore, no conclusions can be drawn regarding the effects of expansion on language development, an increased rate of communication attempts is a desirable effect. Later studies with other populations have helped to bolster the effectiveness of expansion as a language facilitative technique (e.g., Forrest & Elbert, 2001; Pemberton & Watkins, 1987; Weiss, 2002).

Responsivity

To make communication more meaningful to the child, the adult should follow the child's lead (Luetke-Stahlman, 1993; Rose et al., 2004). In the literature this is referred to as "maternal responsivity" and also includes waiting for the child to do something to attempt to communicate, the interpretation of the behavior as meaningful by the adult, and responding with communication to the behavior. These serve to hold the child's interest, but are also an authentic use of language and reinforce its use (Fey, 1986; Kretschmer & Kretschmer, 1978; Rose et al., 2004). Adults need to be sensitive to nonverbal and verbal attempts at conversation so as to reinforce them (Luetke-Stahlman, 1993). When a child with a hearing loss is first learning to communicate, it may not look like the attempts of a hearing child and may go unnoticed. Gesture, eye gazes, or vocalization that may not resemble words often are not recognized as communication. When this happens, the attempt is not reinforced; it is not given meaning. Language has no meaning without a social context.

When a child's vocalizations are reinforced, it encourages the child to voice more, which allows for more opportunities for reinforcement and for development of meaning (Bohannon & Bonvillian, 1997). One of the earliest forms of this is when infants cry (Marschark, Lang & Albertini, 2002). Exactly what has made them cry may be unknown, but caregivers typically respond promptly to soothe the baby and discover the cause. The infant and the caregiver engage in a conversational exchange as they respond to each other. Infants whose caregivers do not respond to their cries soon cry less (Flora,

2004). If a child with a hearing loss tries to express him or herself and sees that it has no meaning to those around him or her, it is less likely to be repeated. It is essential that all attempts at communication by children who have a hearing loss are reinforced (Lewis & Richards, 1988; Luetke-Stahlman, 1993).

Another example that most parents can relate to is the first time their child says /mama/ or /dada/. Developmentally, these are among the earliest consonant vowel combinations produced during canonical babbling (Oller & Eilers, 1988). But ask any parent and they will tell you that, in fact, their baby just said Mama or Dada! The kisses and smiles that ensue firmly reinforce to the infant that these sounds have value which serves to encourage the infant to produce them again.

In normally developing children, maternal responsivity has been found to be positively correlated to children's linguistic development, where children with more responsive mothers displayed more advanced language (Tomasello, 1988), as well as in children with developmental delays (Yoder & Warren, 1999) and in children with expressive language delays (Girolametto, Weitzman, Wiigs, & Pearce, 1999). These effects have also been identified in children who are developmentally delayed (Yoder & Warren, 1999).

Spencer et al. (1992) compared the maternal responsiveness of three groups of mothers: deaf with deaf children (DD; $s=4$), hearing with hearing children (HH; $s=7$), and hearing with deaf children (HL; $s=3$). All of the families were middle class and most of the mothers had college degrees. The children were between 12 and 13 months old, had no other known disabilities and were

developing normally. The children in the DD group were participating in early intervention programs that focused on Total Communication (i.e., speech, signs, speechreading, etc.), had hearing loss in the severe to profound range (i.e., above 70 dB) and were not using any amplification. The children in the HL group were participating in early intervention programs that focused on spoken language, had hearing loss in the moderate to severe range (i.e., 40 – 70 dB) and were all using hearing aids. The children in the HH group were not in any school programs. The dyads were videotaped for three minutes engaging in face-to-face interaction with the child in a highchair. The analysis was based on the mothers' responses to the eye gazes of their child. When the child looked at an object, the mother's response was given one of four codes: response, wait, direct (e.g., child looked at tray but mother redirected attention to the light), and continue (e.g., mother did not alter her behavior based on what the child was doing). Objects had been placed in the room so as to make it obvious what the child was looking at.

The first round of analysis showed that the groups of mothers differed in how they responded to their child most of the time. The mothers in the DD group did more waiting, mothers in the HH group did more responding, and the mothers in the HL group did more directing. The differences in the DD and HH groups could be attributed to the hearing status of the mother and child. Deaf mothers were waiting for their child to look back at them because the nature of visual communication requires sequential rather than simultaneous interaction. By the same token, the hearing mothers were able to respond to the eye gazes of their

hearing children while they were looking at the object because they did not need to look at their mother to receive communication. The mothers in the HH group responded to their children more than both the DD and HL groups.

The second round of analysis looked at the proportion of responses that occurred during or after the child's object gaze. The same videotapes were used. Similarly to the results from the first analysis, there were differences between the groups that could be attributed to the hearing status of the dyads. The DD mothers waited until after their child finished looking at the object to respond. The HH and HL mothers responded most while their child was looking at the object.

When taken together, these results showed that DD and HH mothers responded more to the gazes of their children than did HL mothers. In light of the research that indicates that maternal responsiveness is highly correlated to linguistic development, this is of concern. This may be a contributing factor to the linguistic delays of children with hearing loss, even when they have received early amplification and intervention. However, the inclusion of this study is not meant to be an indictment of hearing mothers who have children with hearing loss. The intent is to illustrate that caregiver response to acts as subtle as eye gaze plays an important role in the linguistic development of children and that this is a strategy that can easily be applied by a teacher within a classroom.

Self-talk and Parallel-talk

For children who may not be attempting any communication, adults can stimulate conversation by using self-talk or parallel-talk (Luetke-Stahlman, 1993;

Fey, 1986). Self-talk is the act of talking out loud and describing what you are doing or thinking (Luetke-Stahlman, 1993). This can be done during play where the adult describes the toy (e.g., while playing with a horse, “My horse is nice. He says, ‘Neigh! Neigh!’”) or during instructional activities (e.g., “I want to plan a trip to the zoo. First, I have to look at the map...”). Parallel-talk is a similar strategy where the adult describes or narrates the child’s behavior. This technique models language for the child, but also places him or her in a conversation with the adult, albeit in a passive role. Other benefits are that it establishes a shared point of interest, conveys interest in the child, and also provides multiple opportunities for the child to participate (Luetke-Stahlman, 1993; Raver et al., 2012).

Raver et al. (2012) measured the effects of teacher parallel talk on the turn taking, verbal commenting, non-verbal responding, imitation and questioning behavior of three children with hearing loss. Each child was attending an oral program and had either hearing aids, cochlear implants, or both. All of the children were exhibiting a one year delay in expressive and receptive communication and pragmatics. They were between the ages of 3 years 7 months and 5 years 3 months, and had hearing losses of moderate-severe, severe and profound (i.e., above 55 dB). One of the children also had vision loss due to coloboma with microphthalmia. There was one teacher and three paraeducators in the class. The paraeducators participated in the study.

Sessions consisted of a paraeducator sitting at a table with the child while he or she played. During baseline, the paraeducator only responded to

questions posed by the child. During intervention, she provided five minutes of parallel-talk, which consisted of describing the child's actions and emotions. The effects of the intervention were measured in two different settings. First, after the five minutes of intervention, the child was allowed to continue playing with baseline conditions for four minutes. Second, the children were paired with a peer who was not participating in the study and allowed to play with the same materials for five minutes. All sessions were videotaped and coded and the study spanned 15 weeks.

All children demonstrated an increased rate of turn taking while at the table with the paraeducator, and two of the three children also had an increase in verbal comments and non-verbal responses. During the free play time after intervention sessions, all exhibited an increase in turn taking, and during free play time with a peer, all exhibited an increase in turn taking and in commenting.

The parallel-talk seemed to have to more effect on the turn taking and commenting behavior of the children. This is a valuable skill for social interaction and by participating in social interactions, affords the child more opportunities to practice and strengthen language.

Many strategies and practices recommended for use with children with hearing loss are based solely on evidence from other populations and have no empirical basis in deafness (Easterbrooks, 2005). Each of the strategies discussed here were selected because they are recommended within the literature for use with children with hearing loss and have been tested within that population, even if only once. These studies do provide support for the use of

these strategies with deaf children and are all easily incorporated into daily content instruction.

Language All Day Long

In schools, the responsibility of teaching language is typically viewed as that of the speech-language-pathologist (SLP). The SLP may provide services within the classroom, but more commonly students go to a separate room and work either individually or in small groups (Garber & Nevins, 2012). The major problem with this model is that it does not support what we know of how language develops when a child has natural access. It has been recommended that strategies for facilitating language development be used by teachers throughout the school day for children with disabilities (Roberts, Bailey & Nychka, 1991). This addresses the concern that skills are not always generalized from therapy sessions, and also this provides the child with more support in a natural way (Kaczmarek, 1985). Kretschmer and Kretschmer (1995) state that, “isolated language periods should disappear if we remind ourselves that any language, whether first, second, spoken, signed, or written is learned best when communicating in meaningful interaction with fluent models” (p. 3).

Along this line of thought, a distinction can be made between *language development* and *language learning* (Marschark, Schick, & Spencer, 2006). Language development is what happens naturally when a child has access to the language around him or her. Language learning is what happens when a child is taught language, for example in school. While a school aged child would be by definition past the typical age for language development, by incorporating

language facilitation strategies into instruction, a teacher of the deaf can attempt to replicate the circumstances under which language normally develops.

Effects of Strategies in School Settings

Nind, Kellett, and Hopkins (2001) measured the effects of a training program on a communication technique called Intensive Interaction when used with students who had severe learning difficulties and who also had physical disabilities, sensory disabilities or autism. The technique is described as being based on characteristics of motherese and emphasizes the teacher adjusting his or her language to match that of the child. Four teachers were trained in the technique and then were recorded two times each interacting with their students. The seven children in the study were described as preverbal or nonverbal, and were between the ages of 3 and 19 years old. They found that teachers who used more features of motherese with their students elicited more responses from the students. The one category that all of the teachers employed with every student was titled “interactive behaviors” and was defined as, “Behavior having the potential to initiate, sustain or spiral an interaction,” and “Behavior being directed towards the other person as a person, rather than being merely incidental to the presence of the person” (p. 149). This description encompasses the techniques discussed above.

Girolametto, Weitzman, and Greenberg (2003, 2004) conducted a series of studies designed to measure the effectiveness of a training program that is aimed at training childcare providers to facilitate language development by following the child’s lead, using techniques to continue conversations, and using

techniques that model correct language. The children in their studies did not have any known disabilities, had typically developing language and were between the ages of 18 and 72 months old. Together the studies included 33 teachers and 188 children. Both studies showed that the changes in the caregivers' communication techniques as learned in the program had a positive impact on the language development of the children.

These studies, in combination with many of the studies presented under the specific strategies, show that the application of language facilitation strategies in a school or school-like setting can produce positive linguistic gains for children. As discussed earlier in the chapter, the heterogeneity of the population and the low-incidence of hearing loss make it difficult to conduct large-scale studies. However, remembering that these strategies have been identified through research with non-disabled children helps to lend strength to the findings reported here.

Survey Research

Survey research is an effective way of collecting a large amount of information in a short time, and also is effective in obtaining information from participants that are not located together. A sample of surveys that have been conducted within the field have focused on efficacy beliefs (Garberoglio et al., 2012), literacy theoretical beliefs (Williams, 1995), how teachers think about their classroom practice (Marlatt, 2001), use of literacy and science/mathematics practices (Easterbrooks et al., 2006), needs surveys (Dodd & Scheetz, 2003;

Luckner, Muir, Howell, Sebald & Young, 2005; Teller & Harney, 2005/2006) and teacher characteristics (Scheetz & Martin, 2008).

Garberoglio et al. (2012) used a survey to explore teacher efficacy in deaf education. They solicited participants nationally by using personal contacts, existing listservs, and direct contacts to schools, and 296 professionals responded. Data were collected via an online survey tool. The survey consisted of a demographic section, 24 items related to teacher efficacy beliefs, and a third section with items related to education setting. The strongest predictor they found for teacher self-efficacy was related to the collective educational setting, and second strongest was related to years of experience.

Williams (1995) used a survey approach when she compared the language and literacy beliefs of three preschool teachers. This study was reported in full earlier in the chapter under the “Beliefs” section. Through interviews and observations, she was able to describe the theoretical beliefs held by the teachers and the extent to which their instruction aligned with those beliefs.

Easterbrooks et al. (2006) conducted a similar study regarding literacy and science/mathematics practices used by teachers of the deaf. They identified 20 practices that were recommended for use and distributed it to teachers of the deaf across the county who had been identified as master teachers. Their questionnaire asked respondents to rate how likely they were to use each practice and how effective they thought it was. Thirty-seven teachers responded rating how likely they were to use each practice and how effective they thought

each practice was. The data indicated that the teachers who participated used the identified practices and endorsed their use.

Three needs assessments have been done using surveys. The goal of the first was to obtain feedback from teachers regarding how well their preparatory programs had equipped them to teach deaf students. Dodd and Scheetz (2003) sent questionnaires to 250 teachers who were identified through the Georgia Professional Standards Commission and the Georgia Department of Education. One hundred and ten teachers responded. Demographic data, including years of experience, were included on the survey. No other methodology was reported. The overall finding of their survey was that the teachers who responded felt as though their preparatory programs had adequately equipped them for their careers.

Another needs assessment was also aimed at teacher preparation, but from the perspective of administrators (Teller & Harney, 2005/2006). The focus was on the skills needed by teachers of the deaf in their school programs. One hundred program directors were randomly selected out of 643 to receive an email which contained the invitation to participate and the survey. A thank you and reminder email was also sent. Nineteen administrators completed and returned the 30-item survey. The results indicated that the administrators predicted a need for more resource and itinerant teachers, and that teachers of the deaf were leaving their programs with a very heavy behaviorist perspective.

The third needs assessment included data obtained from 331 respondents collected over 18 months (Luckner et al., 2005). Various professionals in deaf

education and parents of deaf children responded to items designed to collect information to inform future directions of research and training. The survey was widely advertised in journals and listservs with a potential audience of over 85,000. It was distributed electronically and consisted of Likert responses, demographics and open-ended questions. The participants identified a number of needs for research and training, including training administrators in the needs of students with hearing loss and how best to teach reading and writing.

In the last study to be discussed under this section, Scheetz and Martin (2008) wanted to compare the characteristics of National Board Certified Teachers (NBCT) with those identified by their professors as master teachers. Participants were identified through university professors across the United States. Eleven teachers participated (NBCT=7, master teachers=4). A variety of methods were used to collect data, including a survey, observation, and interviews. The survey was open-ended and contained a demographic section. The data showed that both groups of teachers were highly skilled and that NBCT teachers had a better understanding of the global picture of deaf education and had a greater focus on self-reflection.

These studies demonstrate the effective use of surveys within the field of deaf education to collect data from a geographically dispersed participant pool to describe the state of an issue. The study being proposed here also aims to collect information from teachers of the deaf who are spread out across a large area in an attempt to describe the current use of identified strategies.

Summary

Research continues to suggest that deafness in and of itself is not the reason for delayed language. When natural opportunities exist for interactions with caregivers, children with hearing loss can develop age-appropriate language, whether it is in English or ASL, which will follow the typical developmental sequence (Mayberry, n.d.; Steinberg, 2000). When this typical development is interrupted by impeded access to language, delays occur. The literature related to language development in children with hearing loss is difficult to synthesize. It is operationalized differently across studies and may include speech abilities, English grammar or syntax, or ASL grammar or syntax. Additionally, there are so many variables that affect the language development of these children; it can be difficult to draw conclusions.

Early intervention is giving many infants with hearing loss the support needed to develop language at a faster rate and to a higher level. The recipe for success is being fine-tuned. It does, however, remain that many deaf children, despite early intervention services and benefits of amplification, begin school without a fully developed language and are not achieving at the level of their hearing peers (Marschark et al., 2011). Language ability is related to literacy and school success (Luckner et al., 2012). When students with hearing loss begin school without a fully developed language, they must then face the task of learning one, or two, languages and content area material at the same time. It then becomes incumbent upon the teacher of the deaf to begin or continue to foster the development of language.

It has been acknowledged within the field for many decades that the primary need for deaf children is to develop language competency and that it is the primary goal of the teacher of the deaf to help them do it. Governing bodies have created standards to attempt to ensure that teachers are prepared to meet the diverse needs of their students. Research with normally hearing children and with children with other types of disabilities has identified specific strategies that are effective in facilitating the language development of deaf children. These occur within a conversational framework and include: recasts, extensions, responsivity, and self-talk/parallel-talk. These strategies were selected for inclusion in this study because they have a research base, albeit scarce, in deafness. Other studies have demonstrated that teachers can be taught to use these strategies and that their use has a positive effect on language.

Surveys are an effective tool to gather large amounts of information from many people in a small amount of time. They are often used at the beginning of a line of inquiry to construct a description of the current state of things. The following study is being proposed to do just that regarding the strategies employed by teachers of the deaf within their classrooms to facilitate the language development of children with hearing loss.

After performing a synthesis of available research related to the language development of deaf children, Marschark (2001) concluded that more was needed regarding providing access to language and methods of facilitating language development in children with hearing loss. Research since that time has continued to focus on speech skills or on specific aspects of language, rather

than on instructional techniques that facilitate language development in general (Marlatt, 2001; Raver et al., 2012). With all of the attention that language development gets, we do not know exactly what teachers of the deaf are doing in the classroom (Knors & Hermans, 2010), and we do not know if the recommended practices actually facilitate language development in children with hearing loss (which is beyond the scope of this study). Knors and Hermans (2010) sum up the situation by saying:

The question is whether application of general principles and of adapted instruction really takes place, and if so, to what extent and whether in a similar or different fashion in regular compared to special education. In fact, we hardly have any information about this issue. (p. 61)

The purpose of this study was to describe the use of specific language facilitation strategies used by teachers of the deaf based on their self-report. This is a necessary first step in this avenue of inquiry, as it is heretofore unexplored.

CHAPTER III

METHODOLOGY

This study was intended to begin a line of inquiry into the practices used by teachers of the deaf to facilitate language development by obtaining self-reports of use of recommended strategies. Data were also analyzed for relationships between years of experience, level of education, grade level taught, and communication modality used. This chapter will describe the methods used to solicit participants, construct the questionnaire, and analyze the data. An application to perform research with human subjects (Appendix G) was submitted to the Institutional Review Board. Subsequent to approval (Appendix H), data were collected.

Participants

The targeted participants for this study were teachers of the deaf currently teaching in the State of Florida. There is no state-wide database identifying teachers of the deaf currently teaching in the state, so the exact number of potential respondents was unknown (Leanne Grillot, personal communication, March 21, 2012). The Resource Materials and Technology Center (RMTC) is part of the resource services system in the state of Florida that provides materials and outreach services to districts across the state for students who are deaf or hard of hearing. The RMTC distributes a monthly electronic newsletter

called *Tech Notes* that has information relevant to the field of deaf education. There are currently over 800 subscribers, not all of whom are teachers of the deaf. An announcement was posted in this newsletter asking for volunteers to participate. Additionally, the notice was posted to the internal News at the Florida School for the Deaf and for the Blind (FSDB). There are currently 64 teachers of the deaf working as classroom teachers at FSDB. The announcement was posted in the newsletter and on FSDB's internal News twice, with the second being two weeks after the first. Teachers of the deaf were asked to voluntarily complete the survey. The completion of the survey was tacit consent for participation. Because there is no way of knowing how many potential respondents there were, there was no way to calculate a response rate. However, for statistical validity, 49 participants were needed, and 57 completed surveys were obtained. Participation was encouraged by offering the opportunity for participants to enter their names into a drawing to win one of three \$50 VISA gift cards.

Survey Instrument

A cross-sectional survey was used to collect information regarding the language facilitation practices of teachers of the deaf (Appendix E). Surveys are an effective means of gathering a large amount of information from a large group of people and are very commonly used in education (Dornyei, 2003). Additionally, as this study was a first step in this line of inquiry, it was necessary to describe the current state of the issue, namely, what are teachers of the deaf doing in the classroom to facilitate language development?

The questionnaire began with six demographic questions. This information was used during the data analysis to identify any differences based on level of education, years of experience, grade level taught, and communication method used. Responses were categorized before analysis (Gay & Airasian, 2000). The next section was a list of 21 statements that reflect the recommended practices and major themes discussed in Chapter 2, and an additional four extraneous items. Three items for each of the four strategies (i.e., recasting, extension, responsivity, and self-talk/parallel-talk) and the three major themes (i.e., language is the priority, conversations are the vehicle for language development, and language should be addressed all day) were constructed. For each area, two items were written in a positive direction and one was written as an inverse. At the end, participants were asked to provide examples of other things they do to promote language development. The order of the items was determined by using a random list generator.

The concepts being explored through this survey are very basic. Items were worded in such a way as to be clear, which may result in participants being able to discern the pro-social response and not report on their own behavior. To aid in analysis in determining if this happened, four items were constructed based on an approach to language that, prior to No Child Left Behind and the emphasis on research-based practice, was a mainstay in deaf education (Easterbrooks, 2005). The Language Experience Approach is a strategy that uses students' personal experiences for writing catalysts. Either through their own exploration or thru teacher mediated activities, students experience an

activity related to a specific concept or learning objective. They are then asked to tell the story of their experience verbally (i.e., speech or sign). The student's own words are then transcribed or translated into proper English by the teacher (Johnson & Roberson, 1988; Schleper, 2002). The philosophy behind this is that reading and writing are reinforced because the student's own experience and verbal language is used. The literature syntheses by Luckner et al. (2005/2006) and Easterbrooks (2005) discussed in Chapter 1 demonstrated that the research base for this approach with students with hearing loss was lacking. Because it featured in both of these syntheses and is intuitively a good idea, it was selected as the basis for the four extraneous items.

Participants were asked to rate how well each statement describes what they do with their students. The response scale only was adapted from the "Strategy Inventory in Language Learning" questionnaire (Oxford, 1990) which was designed to describe the language learning strategies used by students learning a second language. This scale was desirable for its use of the phrase "true of me" in the options. The scale in the original survey had five options; the current survey provided only four to limit the option of a neutral response. It was estimated that the survey would require 10 minutes to complete; the average response time was 15 minutes. All other components of the survey are the creation of this author.

Questionnaire Item Analysis

There were eight dependent variables for this study, the four facilitation strategies and the four concepts. The following table presents the item

grouping and research support for each dependent variable.

Table 4

Questionnaire Item Analysis

Strategy/ concept	Questionnaire item	Item Number	Related research
Recasting	When a student says/signs something incorrectly, I repeat it back in a grammatically correct way.	17	Luetke-Stahlman (1993); Prinz and Masin (1985)
	I model language by repeating my students' own words/signs back to them.	2	
	If a student says/signs something, I wait until later to offer correction so as not to disrupt a lesson.	4	
Extension	When a student says/signs something incorrectly, I model the correct way to say it and then expand on what they said.	15	Luetke-Stahlman (1993); Scroggs (1975)
	During instruction with my students, I repeat what they say but use different words/signs to say the same thing to expose them to new vocabulary.	25	
	When I am teaching, I acknowledge students' comments, but keep the lesson moving.	7	
Responsivity	When chatting with my students, we talk about whatever they want to talk about.	18	Luetke-Stahlman (1993); Rose, et al. (2004);
	I respond to my students when they try to talk to me, even if they are just gesturing or making a noise.	6	Kretschmer & Kretschmer (1978); Spencer et al. (1992)
	I like to choose the topic when chatting with my students.	12	

Table 4, continued

Strategy/ concept	Questionnaire item	Item Number	Related research
Self-talk/ Parallel-talk	I say my thoughts out loud to model the thinking process for my students.	21	Luetke-Stahlman (1993); Raver et al. (2012)
	I put words on what my students are doing to make a connection for them between their actions/feelings and language.	9	
	I encourage students to make their own connections between their actions/feelings and language.	13	
Conversation	I make time to just chat with my students.	11	Spencer, 2003; Miller and Luckner (1992); Gustafson and Dobkowski (1995); Boothroyd & Gatty, 2012; Steinberg, 2000
	I design lessons and activities that allow my students to talk with each other.	14	
	When I am teaching a lesson, I do most of the talking.	23	
Language all day	I incorporate ways of helping my students develop their language into all subject areas.	22	Roberts et al. (1991); Kaczmarek (1985); Kretschmer and Kretschmer (1995)
	I focus on supporting the language development of my students throughout the day.	8	
	I focus on science during science lessons and language during language lessons.	20	
Language is priority	I teach my students new words/signs when opportunities come up, even if it is not during instruction time.	16	Pinter & Paterson (1916); Spencer & Marschark (2010)
	I incorporate language objectives into all of my lessons.	24	
	I teach my students content material and the speech-language-pathologist teaches them language.	3	

Table 4, continued

Strategy/ concept	Questionnaire item	Item Number	Related research
Extraneous items (Language Experience Approach)	Most of my lessons are set up so that students have an opportunity to do an activity.	1	Schleper (2002)
	I have my students tell me about their experiences then I write what they say in English.	5	
	I encourage my students to write about their own experiences so that they can read it again to reinforce their language development.	10	
	I use the student's own writing for reading instruction.	19	

Content Validity- Expert Panel Review

To establish content-validity, an expert panel was used (Ary, Jacobs, & Razavieh, 1996). Seven professionals were asked to review the questionnaire and to comment on the clarity of the items, identify any bias they may see in the wording of the items, and the relevance of the items. Their areas of expertise included speech-language pathology, psychology, audiology, instructional support, and educational assessment. All professionals are currently working in the field of deaf education. These professionals were selected to serve as reviewers due to their extensive years of experience, their varying levels of education, and as an attempt to include the perspective of a variety of professionals who work with children with hearing loss. Care was given to include professionals who have teaching certification but who are not currently teaching so as not to contaminate the potential participant pool, and also so as to

include deaf people. One reviewer did not return feedback in time to be considered. The only concern expressed by some of the reviewers was that the questions may be “obvious.” This was an issue that was already recognized and care had already been taken to minimize this as much as possible. No one had any suggestions for improvement. Two changes were made to the survey based on feedback from the reviewers. One suggestion was to add an option for respondents to comment about each item so that additional thoughts did not have to be held until the end. An optional comments section was added after each survey item based on this feedback. Also, one reviewer pointed out that the teachers who taught at the Florida School for the Deaf and the Blind (FSDB) would not fit into any of the original categories; therefore, a new category of “FSDB regular classroom teacher” was added.

Survey Distribution

The questionnaire was accessed and completed through an internet-based survey tool supported by the University of Northern Colorado called Qualtrics. There are many benefits to using internet survey tools. They are an efficient way of collecting information from a large number of people, reduce the cost associated with printing and mailing papers, and reduce the time required to both distribute the survey and receive it back (Schmidt, 1997). One drawback to using this method is that potential participants may not be comfortable with using technology and may therefore not choose to participate. The announcements in the *Tech Notes* electronic newsletter and FSDB’s News contained a link for

participants to click on that took them to the survey. The survey was active for four weeks and was announced again at the two-week mark.

Follow-up Observations

Data triangulation is a way to establish validity in qualitative research (Guion, Diehl, & McDonald, 2011). The goal is to collect the same information from more than one source. One way of doing this is through multiple methods of data collection. The goal is to obtain similar results from the different methods thus strengthening the results. In this study, follow-up observations were conducted with a small number of participants to substantiate the survey responses and provide greater validity to the data. This is commonly done with surveys (Mathison, 1988).

Four teachers of the deaf who worked at the Florida School for the Deaf and the Blind consented to being observed teaching one time for one hour each. Frequency data were collected regarding each teacher's use of the four strategies. The teacher's provided the time for the observation and selected the lesson.

Data Analysis

Response categories were analyzed by assigning each response option a numerical value between 1 and 4. For inverse items, responses were coded as the opposite. For example, a 4 response was coded as a 1, a 3 response was coded as a 2, and so on. Descriptive statistics of frequency, mean, and standard deviation were calculated for each survey item. Cronbach alpha was used to analyze internal consistency. Using the IBM SPSS Statistics (v20) software,

univariate analysis of variance (ANOVA) and multivariate analysis of variance (MANOVA) were conducted to identify differences between the endorsement of an item and the teacher's level of education, years of experience, grade level taught, and communication modality used. Comments that were left after the survey items were grouped into dependent variables and analyzed for congruence with the item responses. The following research questions were framed to identify the extent to which teachers of the deaf report using strategies that have been recommended to facilitate language development in children with hearing loss.

Research Questions

- Q1 To what extent do teachers of the deaf report using strategies that have been recommended for facilitating the development of language in children with hearing loss?
- Q2 Are there differences in the reports of teachers of the deaf based on years of experience, education, grade level taught, or communication modality used?

Summary

The intent of this study was to describe the extent to which teachers of the deaf report using specific strategies that have been recommended for use to facilitate language development and to identify any statistical relationships that may exist between amount of use and years of experience, level of education, grade level taught, and communication modality used. An online survey tool was used and 57 completed questionnaires were collected. Responses were analyzed using ANOVA and MANOVA. Respondents had the opportunity to leave comments after every item, and the last item of the questionnaire was an

open-ended question. All of the comments were analyzed qualitatively. The results of the analysis are presented in the next chapter.

CHAPTER IV

RESULTS

The purpose of this study was to describe the extent to which teachers of the deaf reported using strategies that have been identified in the literature as facilitating the language development of children with hearing loss. The data were analyzed in a number of different ways to extract meaning. This chapter presents an analysis of the data.

Descriptive Data

The first six questions on the survey collected demographic information from each respondent. Fifty-eight surveys were completed and one was excluded due to the respondent reporting that she taught blind/low vision students. This resulted in 57 completed surveys being included in the analysis. The overwhelming majority of respondents were female (93%) and reported using Total Communication (86%) (a combination of signs and spoken English) to communicate with their students. The number of respondents who had Bachelor's degrees (49%) and Master's degrees (47%) was almost equal. The years of experience of the respondents ranged from 0 to 38, and they reported teaching grade levels from prekindergarten to high school. The complete demographic data are presented in Table 5.

Table 5

Demographic Data

Gender	<i>n</i>	%
Male	4	7
Female	53	93
Degree earned		
Bachelor's	28	49
Master's	27	47
Doctorate	0	0
Other*	2	4
*Three respondents marked "Other" but their comments put them in the category of "Master's" so they were included in that category for analysis.		
Job Responsibility		
Itinerant	19	33
Resource	3	5
Self-contained	15	26
FSDB regular classroom	18	32
Other*	2	4
*Five respondents marked "Other" but their comments put them in established categories so they were included in the appropriate category for analysis.		
Communication Modality		
ASL	2	4
Spoken English	6	11
Total Communication	49	86
Grade Level		
Birth to prekindergarten	3	5
Elementary	22	39
Middle	9	16
High	17	30
K to 12	6	10
Years of Experience		
0 to 2	5	9
3 to 5	3	5
6 to 15	27	47
16 to 25	8	14
26 to 38	14	25

Note. FSDB = Florida School for the Deaf and the Blind

Analysis by Research Question

A combination of descriptive statistics and statistical analysis was used to answer the research questions. The results are presented by question.

Research Question 1

To what extent do teachers of the deaf report using strategies that have been recommended for facilitating the development of language in children with hearing loss?

Descriptive statistics were used to answer this question. Means, standard deviations, and frequencies were calculated for each questionnaire item. The results indicated that there was very little variation in how respondents answered the items. The majority of responses were in the “usually true of me” and “always or almost always true of me” categories. There were, however, two notable exceptions. The first was for the item, “When I am teaching, I acknowledge students’ comments but keep the lesson moving.” This was one of the inversely stated items and, to be consistent with the concept of making language a priority, respondents would have needed to indicate that they did not do this. However, the majority of respondents indicated that they did do this (only one person said she did not). The other exception was to the item, “I encourage students to make their own connections between their actions/feelings and language.” This item was also inversely stated and to be consistent with the concept of self-talk/parallel-talk, respondents would have had to rate this item low. There were responses in each category, but 70% indicated that it was “usually true” of them and 21% indicated that it was “always or almost always true” of them. As is evident by the means for each item, several of the survey items did not have responses in each response category. Table 6 presents the mean and standard deviation for each item (the inverse items are

recoded to aid in comparisons). The frequencies are reported in Table 7 (the inverse items are not recoded to reflect actual responses).

Table 6

Means and Standard Deviations for Each Item (n=57)

Strategy/ concept	Questionnaire item	Mean	Standard deviation
Recasting	When a student says/signs something incorrectly, I repeat it back in a grammatically correct way.	3.18	.685
	I model language by repeating my students' own words/signs back to them.	2.86	.718
	If a student says/signs something, I wait until later to offer correction so as not to disrupt a lesson. (recoded)	3.14	.639
Extension	When a student says/signs something incorrectly, I model the correct way to say it and then expand on what they said.	3.32	.506
	During instruction with my students, I repeat what they say but use different words/signs to say the same thing to expose them to new vocabulary.	3.02	.641
	When I am teaching, I acknowledge students' comments, but keep the lesson moving. (recoded)	1.68	.572
Responsivity	When chatting with my students, we talk about whatever they want to talk about.	3.11	.524
	I respond to my students when they try to talk to me, even if they are just gesturing or making a noise.	3.61	.750
	I like to choose the topic when chatting with my students. (recoded)	2.75	.576
Self-talk/ Parallel-talk	I say my thoughts out loud to model the thinking process for my students.	3.26	.518
	I put words on what my students are doing to make a connection for them between their actions/feelings and language.	3.25	.662
	I encourage students to make their own connections between their actions/feelings and language. (recoded)	1.89	.588

Table 6, continued

Strategy/ concept	Questionnaire item	Mean	Standard deviation
Conversation	I make time to just chat with my students.	3.39	.648
	I design lessons and activities that allow my students to talk with each other.	3.07	.678
	When I am teaching a lesson, I do most of the talking. (recoded)	2.49	.601
Language all day	I incorporate ways of helping my students develop their language into all subject areas.	3.60	.530
	I focus on supporting the language development of my students throughout the day.	3.75	.474
	I focus on science during science lessons and language during language lessons. (recoded)	3.07	.678
Language is priority	I teach my students new words/signs when opportunities come up, even if it is not during instruction time.	3.67	.476
	I incorporate language objectives into all of my lessons.	3.28	.726
	I teach my students content material and the speech-language-pathologist teaches them language. (recoded)	3.12	.965
Extraneous items (Language Experience Approach)	Most of my lessons are set up so that students have an opportunity to do an activity.	3.47	.630
	I have my students tell me about their experiences then I write what they say in English.	2.58	.844
	I encourage my students to write about their own experiences so that they can read it again to reinforce their language development.	3.07	.678
	I use the student's own writing for reading instruction.	2.16	.797

Table 7

Percentage of Respondents in Each Response Category (n=57)

Strategy/ concept	Questionnaire item	Response Category			
		1	2	3	4
Recasting	When a student says/signs something incorrectly, I repeat it back in a grammatically correct way.	0	16	51	33
	I model language by repeating my students' own words/signs back to them.	3	23	58	16
	If a student says/signs something, I wait until later to offer correction so as not to disrupt a lesson.	26	63	9	2
Extension	When a student says/signs something incorrectly, I model the correct way to say it and then expand on what they said.	0	2	65	33
	During instruction with my students, I repeat what they say but use different words/signs to say the same thing to expose them to new vocabulary.	0	19	60	21
	When I am teaching, I acknowledge students' comments, but keep the lesson moving.	2	0	63	35
Responsivity	When chatting with my students, we talk about whatever they want to talk about.	0	9	72	19
	I respond to my students when they try to talk to me, even if they are just gesturing or making a noise.	5	0	23	72
	I like to choose the topic when chatting with my students.	5	67	26	2
Self-talk/ Parallel-talk	I say my thoughts out loud to model the thinking process for my students.	0	3	67	30
	I put words on what my students are doing to make a connection for them between their actions/feelings and language.	2	7	56	35
	I encourage students to make their own connections between their actions/feelings and language.	2	7	70	21

Table 7, continued

Strategy/ concept	Questionnaire item	Response Category			
		1	2	3	4
Conversation	I make time to just chat with my students.	0	9	44	47
	I design lessons and activities that allow my students to talk with each other.	3	9	65	23
	When I am teaching a lesson, I do most of the talking.	3	44	51	2
Language all day	I incorporate ways of helping my students develop their language into all subject areas.	0	2	37	61
	I focus on supporting the language development of my students throughout the day.	0	2	21	77
	I focus on science during science lessons and language during language lessons.	24	60	14	2
Language is priority	I teach my students new words/signs when opportunities come up, even if it is not during instruction time.	0	0	33	67
	I incorporate language objectives into all of my lessons.	0	16	40	44
	I teach my students content material and the speech-language-pathologist teaches them language.	42	39	9	10
Extraneous items (Language Experience Approach)	Most of my lessons are set up so that students have an opportunity to do an activity.	0	7	39	54
	I have my students tell me about their experiences then I write what they say in English.	14	23	54	9
	I encourage my students to write about their own experiences so that they can read it again to reinforce their language development.	2	14	60	24
	I use the student's own writing for reading instruction.	19	51	25	5

Note. 1= Never or almost never true of me; 2= Usually not true of me; 3= Usually true of me; 4= Always or almost always true of me

To investigate the high means across most of the dependent variables, Cronbach alpha was calculated to check for internal consistency. This is a coefficient alpha that indicates how well the items measured what they were meant to measure (Ary et al., 1996). The closer the Cronbach alpha to a value of 1, the more internal consistency the items had with each other. A low Cronbach alpha indicates that more than one construct was being measured with the items. The Cronbach alpha for each of the eight dependent variables was quite low. The highest, extensions, was only .541. This can be understood as 45.9% of the variation was due to randomness. Table 8 presents the Cronbach alpha levels for each dependent variable.

Table 8

Cronbach Alpha for Each Dependent Variable

Dependent variable	Cronbach alpha
Recasting	.143
Extension	.541
Responsivity	.102
Self-talk/parallel talk	-.211
Conversation	.300
Language all day	.191
Language is priority	.298
Extraneous (LEA)	.500

Summary. The majority of respondents answered the questions in the same way. With very few exceptions, the items were highly endorsed, indicating that the participants used these strategies to a high degree. Cronbach alpha

values indicated that the items were measuring more than one construct. The low Cronbach alpha values in conjunction with the high standard deviations means that the data were highly unstable and therefore the questionnaire was not able to detect differences.

Research Question 2

Are there differences in the reports of teachers of the deaf based on years of experience, education, grade level taught, or communication modality used? (MANOVA and ANOVA)

This question identifies four independent variables: years of experience, level of education, grade level taught, and communication modality used. The survey items were categorized into eight dependent variables: recasting, expansion, responsivity, self-talk/parallel-talk, conversation, language all day, language is a priority, and extraneous. Multivariate analysis of variance (MANOVA) was used to answer this question. Before analysis could be run, the data had to be readied and several processes were undertaken.

The first process was to recode the inversely stated items. To do this, 4 responses were coded as 1, 3 responses as 2, 2 responses as 3, and 1 responses as 4. The next process was to categorize two of the independent variables. Years of experience and grade level taught were both open-ended questions. The answers for years of experience ranged from 0 to 38. For analysis, five categories were created: Novice: 0 -2; New: 3-5; Experienced: 6-15; Seasoned: 16-25; Expert: 26-38. The number of respondents for each category is reported in Table 9. Responses for grade level taught ranged from early intervention ages (birth to 3 years) through high school. Responses were

placed into one of five categories: birth to preschool, elementary school, middle school, high school, and K-12. The number of respondents for each category is reported in Table 10.

Table 9

Years of Experience of Respondents

Years of Experience	Number of respondents
Novice: 0 – 2	5
New: 3 – 5	3
Experienced: 6 – 15	27
Seasoned: 16 – 25	8
Expert: 26 – 38	14

Table 10

Grade Level Taught by Respondents

Grade Level	Number of respondents
Birth to prekindergarten	3
Elementary school	22
Middle School	9
High School	17
K to 12	6

The last process was to look at the “other” response choice for the two remaining dependent variables. For level of education, five people selected “other.” Three of the comments fit the “Master’s” category and were moved there

leaving two responses in the “other” category (one for Specialist and the other person did not leave a comment). These data are presented in Table 11.

Table 11

Respondents’ Level of Education

Degree Earned	Number of respondents
Bachelor’s	28
Master’s	27
Doctorate	0
Other	2

The last dependent variable was regarding communication method. The majority of respondents indicated that they used Total Communication for instruction of their students. No changes were made to these data, and they are reported in Table 12.

Table 12

Communication Modality for Instruction Used by Respondents

Communication Modality	Number of respondents
American Sign Language	2
Spoken English	6
Total Communication	49

Job responsibility was not an independent variable; however the information was collected to aid in qualitative analysis. This question also had an “other” option and upon analysis, five of the responses fit into established

categories and were moved into the appropriate category for analysis. These data are presented in Table 13.

Table 13

Respondents' Job Responsibility

Job Description	Number of respondents
Itinerant	19
Resource	3
Self-contained	15
FSDB regular classroom	18
Other	2

Note. FSDB = Florida School for the Deaf and the Blind

MANOVA and ANOVA. A multivariate analysis of variance (MANOVA) is a statistical test that compares the means of several groups when there are two or more dependent variables (Glass & Hopkins, 1996). A MANOVA was conducted with each of the independent variables with the eight dependent variables. No differences were detected at the .05 significance level. The complete MANOVA results are presented in Table 14.

The IBM SPSS Statistics (v20) software that was used to conduct the MANOVA automatically generates a report of each univariate analysis of variance (ANOVA). Review of this report indicated that the mean for the dependent variable of extensions was significant with the means for both years of experience ($F=3.469$; $df=4$; $p=.014$) and communication modality ($F= 5.181$; $df=2$; $p=.009$), even though no differences were detected with the MANOVA.

This indicates that there was a difference in how participants responded to the items in the extensions group based on their years of experience and the communication modality they use for instruction. The complete ANOVA results are presented in Table 15.

Table 14

Multivariate Analysis of Variance (MANOVA)

Independent variable	<i>F</i>	<i>p</i>
Years of experience	1.115	.322
Level of education	.922	.547
Grade level taught	.809	.756
Communication modality	1.554	.098

Post Hoc. To identify exactly which means within the dependent variables were significantly different, Tukey HSD pairwise comparisons were conducted for each dependent and independent variable that produced a significant ANOVA result. This analysis identifies which group means are different, but does not indicate a directional relationship (Glass & Hopkins, 1996). For the independent variable of years of experience, the means for the dependent variables of groups Experienced (6-15 years) ($p=.011$), Seasoned (16-25 years) ($p=.009$), and Expert (26-38 years) ($p=.009$) were significantly different from the mean for the New (3-5 years) group. For the independent variable of communication modality, the means for the Spoken English only ($p=.007$) and Total Communication ($p=.011$) groups were significantly different

from the mean for the American Sign Language group. These results are presented in Table 16.

Table 15

Univariate Analysis of Variance (ANOVA) for Dependent Variables

Independent variable	Dependent variable	Degrees of freedom	<i>F</i>	<i>p</i>
Years of experience	Recasting	2	1.520	.228
	Extensions	2	5.181	.009
	Responsivity	2	.245	.783
	Self-talk/parallel talk	2	2.331	.107
	Conversation	2	.343	.711
	Language all day	2	.025	.975
	Language is priority	2	1.399	.256
	Extraneous	2	.101	.904
Level of education	Recasting	2	.571	.568
	Extensions	2	.242	.786
	Responsivity	2	.225	.799
	Self-talk/parallel talk	2	.934	.399
	Conversation	2	2.197	.121
	Language all day	2	1.112	.336
	Language is priority	2	1.229	.301
	Extraneous	2	.649	.527
Grade level taught	Recasting	4	1.359	.261
	Extensions	4	.606	.660
	Responsivity	4	1.053	.389
	Self-talk/parallel talk	4	.389	.816
	Conversation	4	.361	.835
	Language all day	4	.338	.851
	Language is priority	4	2.131	.090
	Extraneous	4	.437	.781
Communication modality	Recasting	2	1.520	.228
	Extensions	2	5.181	.009
	Responsivity	2	.245	.783
	Self-talk/parallel talk	2	2.331	.107
	Conversation	2	.343	.711
	Language all day	2	.025	.975
	Language is priority	2	1.399	.256
	Extraneous	2	.101	.904

Table 16

Tukey HSD Results for Significant Dependent Variables

Independent variable	Dependent variables			<i>p</i>
Years of experience	Extensions	New (3-5 years)	Experienced (6-15 years)	.011
			Seasoned (16-25 years)	.009
			Expert (26-38 years)	.009
Communication modality	Extensions	ASL	Spoken English only	.007
			Total Communication	.011

Additional analyses. Although job responsibility was not an independent variable, an ANOVA was conducted with this variable to attempt to gain additional insight into the data. Significant results were obtained for the dependent variables of responsivity ($F=2.646$; $df=4$; $p=.044$) and language as a priority ($F=2.701$; $df=4$; $p=.040$). A Tukey HSD was then calculated for these two to identify which means were significantly different. Under responsivity, no significant difference was identified; however, self-contained and itinerant job responsibility approached significance ($p=.067$). Under language as a priority, the mean for the self-contained group was significantly different from the mean for the Florida School for the Deaf and the Blind (FSDB) teachers ($p=.029$). This indicates that teachers who work in self-contained settings differed from those

who work at FSDB in how they responded to the items in the language is priority group. The results of the ANOVA are present in Table 17 and the results of the Tukey HSD are presented in Table 18. Means and standard deviations for all independent variables are presented by dependent variable in Appendix F.

Table 17

Univariate Analysis of Variance (ANOVA) for Job Responsibility

Independent variable	Dependent variable	Degrees of freedom	<i>F</i>	<i>p</i>
Job responsibility	Recasting	4	.788	.538
	Extensions	4	1.162	.338
	Responsivity	4	2.646	.044
	Self-talk/parallel talk	4	1.250	.301
	Conversation	4	.915	.462
	Language all day	4	.721	.582
	Language is priority	4	2.701	.040
	Extraneous	4	.948	.444

Table 18

Tukey HSD Results for Job Responsibility

Independent variable	Dependent variables	<i>p</i>	
Job responsibility	Responsivity Self-contained	Itinerant FSDB teachers	.067
	Language is a priority Self-contained		.029

Note. FSDB = Florida School for the Deaf and the Blind

Summary. The data were analyzed using MANOVA and ANOVA. No statistically significant results were found through the MANOVA; however, the ANOVA identified a relationship between extensions and both years of experience and communication modality. Tukey HSD further identified where the differences were. The respondents in the New category answered differently than the respondents in the Experienced, Seasoned, and Expert groups, and respondents who used ASL for instruction answered differently than those in the Total Communication and Spoken English groups. These results are interpreted with caution due to the high level of instability of the data as evident through the high means, low Cronbach alpha values, and the small size of the New and ASL groups.

Qualitative Analysis

An optional comment box was added after each questionnaire item based on feedback from the expert review. The following presents an analysis of the comments regarding each of the four dependent variables from research question 1 and of the four concepts.

Recasting

The three questionnaire items for the strategy of recasting were:

1. When a student says/signs something incorrectly, I repeat it back in a grammatically way.
2. I model language by repeating my students' own words/signs back to them.

3. If a student says/signs something, I wait until later to offer correction so as not to disrupt a lesson.

The majority of participants reported that they usually recast their students' statements. Those who left comments after these items clearly have an understanding of this concept. For example, one comment was, "I prefer to make corrections when they are made so the student can have a prompt, direct correlation to the correct rather than waiting until later when the context has changed." Several of the comments expanded the items to be specific as to when these teacher behaviors might be appropriate, such as if the comment by the student was appropriate or not, and whether the correction would be perceived as negative by the student. The first question above seemed to have been interpreted by those who left comments as referring to the ASL/English debate discussed in the first chapter of this dissertation. Six participants left comments and four of them made a distinction between ASL and English. For example, "Depends on the situation, if ASL works then I use ASL which doesn't follow English grammar." Some of the comments for the third item listed above included a behavioral element. Several participants clearly interpreted this as "corrective" in the sense that they were modeling a positive when the student had uttered a negative, rather than just committing a linguistic error.

While the majority of respondents endorsed using this strategy, the analysis of the comments indicates that there may have been some confusion about the true intent of the items. As stated earlier, there was a concern when constructing the questionnaire that the items were transparent and, therefore, the

desired response was apparent. This may have been the case for at least some of the respondents, and is supported by the low Cronbach alpha ($HSD=.143$) that was obtained for this group of items, indicating that they were not measuring one single idea. During the follow-up observations, this strategy was observed once in the middle school teacher and eight times in the prekindergarten teacher. Not only might this strategy be more natural with younger children, but it might also be more suited for less structured lessons.

Extensions, Expansions and Expatiations

The three questionnaire items for the strategy of extensions were:

1. When a student says/signs something incorrectly, I model the correct way to say it and then expand on what they said.
2. During instruction with my students, I repeat what they say but use different words/signs to say the same things to expose them to new vocabulary.
3. When I am teaching, I acknowledge students' comments I but keep the lesson moving.

The majority of respondents indicated that they usually expand on what their students say. The comments for this set of items did not lend much insight into the thinking of the respondents. There were not many comments left for the first and second items above. The third item, however, had seven comments. This item was one of the inversely stated items. For responses to be consistent with the first two items, respondents would have needed to indicate that they usually did not keep the lesson moving when a student made a comment. Sixty-three

percent (63%) of the respondents said that they did do this. All of the respondents who left comments rated this item as a 3 (usually true of me), except one who rated this as a 4 (always or almost always true of me). They all commented that if the student's comment was relevant, then they allowed it. These comments seem to be in conflict with the response choice. Also, it appears as though this item was interpreted in terms of classroom management. During the follow-up observations, this strategy was observed once in the middle school teacher and seven times in the prekindergarten teacher. Because this compliments recasting and often these two are used together, again, it could be that this strategy is more suited to younger children and more conversational exchanges.

Responsivity

The three items for the strategy of responsivity were:

1. When chatting with my students, we talk about whatever they want to talk about.
2. I respond to my students when they try to talk to me, even if they are just making a noise.
3. I like to choose the topic when chatting with my students.

The majority of respondents reported that they usually or almost always respond to their students' attempts at communication and let them lead a conversation. They did not, however, report controlling the topic of the conversation with their students, which is consistent with being responsive to their students. The first item received the most comments, and the comments were highly varied. They

ranged from, “None of my students have anyone at home that signs with them,” to, “As long as they use ‘nice’ words,” to, “...our session can’t consist simply of chatting...When you are working for school administrators and they want to see what you’ve done, you must produce results.” The comments for the second item were equally varied. One teacher commented that all of her students have fluent language, while another said that she encourages her students to fully communicate by using names and complete sentences. Responsivity was observed in all four teachers in the follow-up observations. They all demonstrated an awareness of their students and all attempts at communication were acknowledged in some way.

Self-talk/parallel-talk

The three items for self-talk/parallel-talk were:

1. I say my thoughts out loud to model the thinking process for my students.
2. I put words on what my students are doing to make a connection to them between their actions/feeling and language.
3. I encourage students to make their own connections between their actions/feelings and language.

Respondents highly endorsed using this strategy, and also endorsed encouraging students to make their own connections. The first two items had three comments each. The comments were expansions on the item to indicate how the strategy was used. The third item was the inversely stated item for this group, but appears to have been interpreted as a positive teaching behavior.

Ninety-one percent (91%) of teachers reported that they usually or always do this. The few comments left after this item indicate that this may have been interpreted as teaching students to think deeply about a topic. For example, “This is what I teach --- to make all the connections (KG, 1st, 2nd).” No instances of this were seen in the four follow-up observations.

Conversation

The three items for conversation were:

1. I make time to just chat with my students.
2. I design lessons and activities that allow my students to talk with each other.
3. When I am teaching a lesson, I do most of the talking.

Most of the teachers indicated that they make time to chat with their students. Four teachers contributed comments for this item. They shared that they make use of non-instructional times to talk to their students. The second item had ten comments. Six of them were statements that they worked with students one-on-one therefore this item was not applicable to them. All six of these teachers are itinerant and all answered the item as either never or not usually true of them. This shows a high level of consistency and suggests that respondents were basing their response choices on their actual behavior.

For the third item, there was an almost equal number of responses in the usually not true (25%) and usually true (29%) categories. Two teachers very candidly admitted to struggling with letting the students do most of the talking.

The other comments added to how they apply this, for example, requesting feedback from the students and modeling.

Language All Day

The three items for language all day were:

1. I incorporate ways of helping my students develop their language into all subject areas.
2. I focus on supporting the language development of my students throughout the day.
3. I focus on science during science lessons and language during language lessons.

The second item had two comments and both were puzzling. They were, “I support vocabulary, etc but focus almost not at all on speech,” and, “We use a programmed reading series which is our main focus. We have the students writing sentences in Science, SS, and other classes more than in Reading.” As the item mentions neither speech nor reading, it is not clear where these interpretations came from.

The third item in this group received one of the highest number of responses. It was inversely stated and 85 % of the respondents said that this was never or usually not true of them. Specifically naming language in the item seems to have tapped into the core beliefs of the teachers. The responses reflected a lot of passion:

“Focus yes but language is in every aspect of my day.”

“Language exposure and learning is integrated in all activities/lessons-not a separate entity.”

“Language instruction is incorporated into every subject I teach.”

“Language is taught throughout the day as well as in isolation.”

“Language is intertwined in all subject areas.”

Language Is Priority

The three items for language is priority were:

1. I teach my students new words/signs when opportunities come up, even if it is not during instruction time.
2. I incorporate language objectives into all of my lessons.
3. I teach my students content material and the speech-language pathologist teaches them language.

All of the respondents reported that they either usually or almost always teach new words/signs whenever the opportunity arises, and only nine respondents reported that they usually do not. There were only two comments each for these two items. The third item, however, had 14 comments. Eighty-one percent (81%) of respondents reported that this was never or usually not true of them.

Most of the comments indicated that they teach both content and language:

“I teach them their primary language and all other subjects. The speech teacher supplements what I do and adds her own expertise.”

“Considering the students have language therapy one hour a week in class and I can see what goes on in therapy, I can honestly say that I teach 99.9% of the language as well as all of the content.”

“I teach content as well as language all day. The SLP reinforces speech production and language 30 MPW twice a week.”

“I teach LOTS of language in my room.”

“I constantly focus on language.”

“I teach language as well through teaching content.”

Extraneous

The four items for the extraneous group were:

1. Most of my lessons are set up so that students have an opportunity to do an activity.
2. I have my students tell me about their experiences then I write what they say in English.
3. I encourage my students to write about their own experiences so that they can read it again to reinforce their language development.
4. I use the student's own writing for reading instruction.

Item one was highly endorsed by the participants. Thirty-nine percent (39%) responded with usually and 54 % responded that they always or almost always do this. On its face, this seems like a good practice. Because so many students with hearing loss miss out on opportunities due to their communication barriers, the teacher gives the student the opportunity to have a personal experience with something so she knows for sure the student can relate, and then uses it for instruction. In all of the literature reviewed for this study, no studies were found that would suggest that this, by itself, was not a good idea. It is when it is part of the Language Experience Approach package that the evidence is lacking. Therefore, this dependent variable was not able to play its role in adding to the analysis of the responses. The third item appears to have been negated due to

the same reasons, even though there was more variability in the responses. Eighty-four percent (84%) of participants responded that they do this either usually or almost always.

The second and fourth items produced a wide variety of responses. The majority of participants did report that they usually write what their students tell them (54%), but 37 % reported that they did not or usually did not do this. The majority of participants reported that they usually did not use a student's own writing for instruction (51%), but 19 % said they never did and 25 % said they usually did. This dependent variable had one of the highest Cronbach alpha scores ($HSD=.500$), which is likely a results of the variability in the responses (Gay & Airasian, 2000).

Open-ended Question

The very last question of the survey asked participants to identify any additional strategies they used to facilitate language development. Forty-four respondents, or 77 %, answered this question. Virtually every instructional technique named in the deaf education texts reviewed for this study was listed in their comments. These include: pictures, graphic organizers, captioning, picture prompts, targeted vocabulary development, experience journals, reading, color coding sentences, thematic units, role-playing, journals, language experiences, videoing students telling stories, direct instruction, multiple meanings, visual aids, read alouds, guided discussions, and labels. Some of the comments exemplified the premises of this dissertation:

“Encourage group, on topic discussion—facilitate the discussion---linking what students are saying to each other---

encourage student to be 'great listeners,' watching what's being said and remembering so they can converse with each other on topic..."

"Meal time is a very social time for us."

"Let them help guide the lesson, when giving a new word try to give synonym/antonym and additional signs for comprehension."

"Language is on-going throughout the day. Every subject is language."

"Basically I address whatever comes up in daily interactions with my students in and out of instructional time. For example: a hard of hearing student came in with new shoes the other day and was eager to show them off and talk about them, so I gave him the opportunity to share with the class. This provided me with opportunity to hit some of his language goals on a topic of his choosing. During more structured language time, he is often frustrated by having to correct himself, but he was willing to deal with it on this occasion, as he had something he wanted to say. While he spoke about his new 'hi-tops,' I interpreted for him to the deaf students in my class. One of them was not familiar with the term 'hi-tops.' We then spent a few minutes talking about different names/signs for different styles of shoes. All in all, it took 5-7 minutes out of 'instructional' time, but was well worth it, in my professional opinion. Basically, my philosophy on language instruction is 'anything is game!'"

The examples provided by the participants of additional activities they do to support the language development of their students attests to the level of knowledge they had about instruction. However, the focus of this dissertation was on the universal human construct of language, not on any specific modality or language. Most of the activities listed for this question are found in Deaf Education textbooks that focus on instructional activities to achieve lesson objectives rather than on language facilitation strategies. It is clear that some of

the respondents have an understanding of the difference (see comments above), but this distinction may not be widely known.

Observations

As previously stated, it was a concern that the questionnaire items were transparent and that the desired response was obvious resulting in little variability in how participants responded to the questionnaire items. After reviewing the results of the data analysis and noting the lack of variability in the participants' responses, follow-up observations were indicated to obtain another data perspective to support the results. Participants who wished to be entered into the drawing for the gift card had provided their contact information. Four teachers from this list who work at FSDB were selected based on convenience and grade level, and were asked if they would be willing to allow an observation. It was reiterated to them that their responses were totally anonymous, and that they were known participants only because they entered the drawing. All four teachers consented. The observations were conducted for an hour, and frequency data were collected for each use of recasting, extensions, responsivity, and self-talk/parallel-talk observed.

The first observation was of a high school teacher who facilitates a computer lab. She has a Master's degree in Deaf Education, and has taught for 10 years, all at the high school level. At the time of the observation, there were three students in the class doing independent computer work. Two were taking an honors English class online and one was taking an online college algebra class. During the observation, none of the students required assistance with

their work. The teacher was observed to interact with the students, but it was not instructional.

The second observation was of a middle school teacher. She has a Bachelor's degree and has taught for 7 years, mostly at this level. During the time of the observation, there were two classes of six students. Both were 8th grade US History classes and the topic was Westward Expansion. The lesson was an online unit. It began with a video and then the students were guided through a worksheet activity based on the video. Although students were asked to comment or answer questions, the structure was not conversational. As such, opportunities to use the identified strategies were limited. Recasting and extensions were observed one time each, and self-talk/parallel-talk was not observed. Responsivity was observed 15 times. No missed opportunities, or instances where this strategy could have been used and was not, were observed.

The third observation was of an elementary school teacher. She has a Bachelor's degree in Deaf Education and has been teaching for 17 years. During the observation, there were seven 5th grade students and the lesson was 3D shapes. The activity was very hands-on. The students folded paper into the specified shapes and then used it to answer questions about the number of faces, lines, and vertices. Interaction was focused on instruction on folding the paper and on answering the questions. The only strategy observed was that of responsivity; no missed opportunities were observed.

The fourth observation was at the preschool level. The teacher has a Bachelor's degree in Deaf Education and four years of teaching experience. The classroom follows a Montessori philosophy and there were 10 students present that day. At the beginning of the observation, they did a brief circle time. All of the students were called to the carpet and were seated in a circle. The teacher started with drawing names from a basket and holding them up for the children to identify the name as a way of taking attendance. They then sang songs related to the days of the week and the month. After circle time, the students chose their work stations. Most of the students were working independently and the teacher (along with the aide) moved among students. The teacher was observed to use recasting eight times and extensions seven times. There were no observed uses of self-talk/parallel-talk, and 11 instances of responsiveness. There were no instances of missed opportunities to use these strategies observed.

The observations did not totally substantiate the survey results. Few uses of the strategies were observed; however, there were no missed opportunities, or instances where a student said something that could have been addressed through one of the four strategies and was not. Inconsistency between the results of the survey and the observations does not mean that either is not valid (Mathison, 1988). Rather, it can lend insight into the thinking of the participants to assist in data interpretation. Two possible explanations for the disparity are that the teachers are not aware of their actual use of the strategies and that they have competing demands that interfere with the actual use of the strategies.

Language development is a central focus for teachers who work with students with hearing loss. The ubiquitousness of the issue may have led to an internalizing of the concept and associated teaching behaviors, without an awareness of whether or not the strategies are actually being used. The teachers who were observed demonstrated a command of teaching and an awareness of the various needs of their students. Considered together, this is a possible explanation for the infrequent use of the strategies during the observations.

Additionally, the lessons that were observed were very structured and did not allow for exchanges between the teacher and the students. Some strategies are appropriate for use in highly structured settings; however, the strategies discussed in this study exist in conversation. The lessons could easily be restructured to allow the teacher to have conversational exchanges around the instruction that was presented. There are various reasons why a teacher may choose to control a lesson activity to a level that restricts conversational exchange. Teachers are responsible for not only effectively conveying content, but they are also responsible for classroom management. This can be understood as “the actions taken by the teacher to establish order, engage students, or elicit their cooperation” (Emmer & Stough, 2001, p.103) while delivering instruction and making minute-to-minute adjustments based on what is happening. These competing factors interact with student characteristics, class dynamics, and teacher skill level to influence the choices a teacher makes in designing a lesson (Emmer & Stough, 2001). There were several comments to

different questionnaire items that reflected that this was in the mind of at least some of the respondents. Classroom management is a practical concern that may be a barrier to using strategies that require conversation.

This is also indicated by the observation in the preschool classroom. On that day, two teachers were absent. The teacher being observed was not scheduled to lead activities that day and had to step into the role at the last minute. This, coupled with the reduced level of supervision, meant that the teacher had to play a more directive role than normal to orchestrate the activities and supervise the students, and he was not able to interact with the students to the extent he normally would have.

The observations were added after the data had been analyzed to attempt to substantiate the data results. Four teachers who work at FSDB consented to being observed. Frequency data were collected for an observation period of one hour for each of the teachers. Although few uses of the four language facilitation strategies were observed, this cannot be interpreted as conflicting with the participants' responses, as no missed opportunities were observed.

Opportunities to use the strategies may be created through the design of the lesson, but may be affected by competing factors such as the need for classroom management. Additionally, the importance of language development is so pervasive in deaf education that it is possible that the teachers know about them and believed they used them.

Summary

This chapter described analysis of the data and the results of that analysis by research question. MANOVA did not identify any significant differences between the means of the variables. Significant ANOVA results were obtained between extensions and both years of experience and communication modality. Post-hoc analysis for years of experience identified the difference as being between teachers in the New group (3-5 years) and those in the Experienced (6-15 years), Seasoned (16-25 years), and Expert (26-38 years) groups. Additionally, for communication modality the difference was between respondents who identified using ASL as their primary means for instruction and those who use Total Communication and Spoken English only. The low variability in responses and low Cronbach alpha values weaken the significant results and they should be interpreted as indicating a potential relationship rather than a definitive one. Qualitative analysis of the comments indicates that many of the respondents gave the items careful thought and have a high level of knowledge related to effective use of the strategies. Some inconsistencies between response choices and comments were identified. The participants in this study appeared to be well informed regarding instructional practices with students with hearing loss.

CHAPTER V

DISCUSSION

There is a long history of evidence that students with hearing loss struggle to achieve age appropriate language development (Easterbrooks & Baker, 2002; Marschark, 2001). Despite different language modalities and philosophies, their achievement as a whole has remained consistently at about the fourth grade level (Kretschmer & Kretschmer, 1995; Pinter & Paterson, 1916; Sticht, 2002).

Research syntheses conducted in 2005 and 2006 shed light on the fact that little is known about which instructional practices are effective with these students (Easterbrooks, 2005; Easterbrooks et al., 2006; Luckner et al., 2005/2006), and that most practices do not have a research base with students with hearing loss (Easterbrooks, 2005). Additionally, little is known about what teachers of the deaf actually do in the classroom to facilitate language development (Knors & Hermans, 2010).

Four language facilitation strategies were identified that are widely accepted as effective with hearing children and have been tested with children with hearing loss: recasts, extensions, responsivity, and self-talk/parallel-talk. Teachers of the deaf who are currently teaching students with hearing loss were asked to indicate the extent to which they used the identified strategies. The purpose of this study was to be a first step in identifying what teachers of the

deaf do in the classroom to facilitate language development. This chapter will present a discussion of the limitations of the study, will interpret the findings, and will present suggestions for future research.

Limitations

Questionnaires by their very nature have a variety of limitations. There is no ability to verify responses and there is no ability to control for the quality of responses. People choose to complete questionnaires for different reasons and there is a risk that vital respondents may be missed due to lack of interest or lack of time. For example, conscientious teachers who may use the recommended practices regularly may choose not to participate because they do not have time to read newsletters or to complete surveys (Gay & Airasian, 2000). Furthermore, there are many limitations to this survey.

Questionnaire Construction

The concepts being explored through this survey are very basic. The intent was to gain an understanding of whether or not, and to what extent, teachers of the deaf use the four language facilitation strategies. Because the participants would not be able to ask for clarification on an item, they were worded in such a way as to be clear and easily understood. Also, to encourage participation, the questionnaire was purposefully brief. Simplicity and brevity are important considerations in designing a survey, but they do come with limitations (Dornyei, 2003).

The simplicity of the items may have resulted in the participants being able to discern the pro-social response and to not report on their actual use of the

strategies. Response set is the inclination of a respondent to answer all questions the same way (Gay & Airasian, 2000). This can be the social desirability effect, or it can be that the same response is given for all items. Another facet of this is acquiescence bias (Dornyei, 2003). This occurs when participants agree with an item if they are either unsure of the answer or if they are uninterested in the survey itself. All of the items for this questionnaire were carefully worded to be positive and to not include any negative words. Also, only four response options were available so as not to allow for neutral responses. These considerations in construction could have led to participants giving what they thought were desired responses or to eliciting the same response for all items.

This limitation was recognized during the construction of the questionnaire and four extraneous items were added to attempt to illuminate if either type of response set or acquiescence bias happened. As discussed in Chapter 3, the Language Experience Approach (LEA) was a mainstay in deaf education (Easterbrooks, 2005) until it was learned that there is no research to support its effectiveness (Easterbrooks, 2005; Luckner et al., 2005/2006). Because the data surrounding this approach were analyzed through two literature syntheses and it is intuitively a good idea, it was selected as the basis for the four extraneous items.

The rationale for using this as a basis for the extraneous items may have been counterproductive. There is evidence that both types of response set did occur, but also that at least some of the respondents did not simply answer all

the items in the same way, as would be expected with acquiescence. The second and fourth extraneous items yielded a high level of variability. This is evidence to support that response set was not a factor for all participants. However, there was also evidence that respondents contradicted themselves. For example, the comments for the item “When I am teaching, I acknowledge students’ comments I but keep the lesson moving.” Each person who left a comment for this item said that they did this, but also said that if it was appropriate, they stopped the lesson. This could be evidence of acquiescence.

Internal Consistency

Cronbach alpha values were obtained for each of the dependent variables to measure internal consistency. A value of 1 is the highest consistency possible. As stated earlier, all of the dependent variables had values that were very low (see Table 8). This means that the dependent variables were not measuring what they were intended to measure and that the differences in responses were largely due to randomness. It is not possible to say exactly why this happened, and may have been influenced by more than one factor.

Different types of surveys have different levels of expected internal consistency (Gay & Airasian, 2000). The newness of the test and the differences in the participants all play a role. This dissertation represents the first use of the survey. Subsequent administrations with improvements would be expected to increase the reliability of the survey. Also, the more differences in the participants and their responses, the higher the reliability (Gay & Airasian, 2000). The participants for this survey displayed a high degree of similarity in their

characteristics (e.g., level of education, communication modality, gender, etc.) and in their responses. This served to weaken the internal consistency of the items. This very same questionnaire administered to a different set of participants could yield different Cronbach alpha values.

Unknown Response Rate

The fact that the exact number of potential respondents was unknown is a limitation to this study. There is no statewide database that lists all teachers of the deaf who are currently teaching in the state of Florida. Additionally, it was not known how many subscribers to the electronic newsletter used to advertise the survey were teachers of the deaf. Due to this, a response rate could not be calculated. The chart constructed by Krejcie and Morgan (1970) providing recommendations for sample size in educational research suggests that a sample size of 57 would represent a population of 65. It was known that there were 64 teachers of the deaf working as classroom teachers at the Florida School for the Deaf and the Blind at the time of the survey. If the assumption is made that at least this number of teachers are working across the state, then that would yield a conservative estimate of 128 for the sample pool and would have needed a response rate of 97. If there were, in fact, only 128 teachers currently teaching in the state, then the response rate would be 44%. It is mostly likely that the actual number of teachers in the state is much higher which would lower this rate.

Small Sample Size

The details of the survey were inputted into a program called GPower 3.1 (Faul, Erdfelder, Lang, & Buchner, 2007) to calculate the number of respondents needed for statistical significance based on the number of dependent and independent variables. The number returned was 49. While 57 completed questionnaires were obtained, the low sample size compounded with low internal consistency and low response variability weakened the results. There is no guarantee that a larger sample size would have yielded different results. More participants would have given the results more power, but the items may still have lacked the sensitivity to detect any differences. Also, if the participants from a larger sample size also responded in such a highly consistent way as did the participants for the current study, the increased number may not necessarily provide stronger or more significant results.

Follow-up Observations

Follow-up observations were not a part of the original study plan. Once the statistical analyses were conducted and the low variability in responses was identified, additional data were needed to attempt to interpret the results. Because this was post hoc, all participants were not given the opportunity to be observed. The four teachers that were approached, and consented, for observation were selected based on convenience. They were among the few participants known to the researcher and their proximity made them accessible. They all worked at the same school and the observation period was only for one hour. The last-minute nature of the request for the observation meant that care

could not be taken in making sure that the lesson that would be observed would be appropriate for the purpose. This was a complication. Three of the four lessons observed were highly structured and not well suited to the use of the strategies. This does not mean, however, that the lessons could not have been structured in a way so as to allow use of the strategies. All of the strategies are based on students contributing to the lesson with spoken/signed language and could easily be incorporated in to highly structured lessons by allowing the students to be the major contributors of the information.

Low Variability

As has already been stated several times, the low variability in the responses was a major obstacle in this survey. It reduced the power of the analyses, inhibited qualitative analysis, and undermined the reliability of the items. Because not all of the items were answered in the same way, there is some evidence that had the questionnaire items been more sensitive, the results would have been more informative.

Researcher Affiliation

At the time of this study, I worked at the Florida School for the Deaf and the Blind (FSDB). Twenty (20) of the respondents worked at the school as well (18 from the category of "FSDB classroom teacher" and 2 who responded "other"). This translates into 35% of the respondents who participated and 31% of the total teachers of the deaf in teaching positions at FSDB. There is a great sense of community at FSDB and it is likely that many of the respondents participated out of loyalty to a fellow staff member. Additionally, the observations

were conducted with teachers who were known to me. The environment at FSDB is unique when compared to the educational environment in a district school. This high proportion of FSDB teachers may have influenced the results.

Findings and Interpretations

Overall, the teachers who participated in this survey reported using the four identified strategies to a high degree. Differences in responses were identified for the extensions variable between teachers who use ASL for instruction as compared to those who use spoken English only or Total Communication, and between teachers who have 3-5 years of experience when compared to those who have 6-38 years of experience. Based on these results, there are limited implications.

Two people indicated that they use ASL for instruction and this accounted for the difference detected in the means. Review of their actual responses to the three items for the variable of extensions only revealed one major difference from the majority of respondents. One teacher said that she never acknowledges a student's comment and then moves on with the lesson (one of only two people to respond this way). While the statistical result for this was significant, there is no conclusion that can be drawn from the data. Only two people accounted for this difference. That is not a large enough representation to have implications for practice.

Three teachers who participated have 3-5 years of experience and make up the group that was significantly different from the teachers with 6-38 years of experience (separated into three groups for analysis). Again, a review of their

actual responses showed that they responded in the same way as did the majority of the participants so no additional information was gleaned from this. No pattern could be discerned from their actual responses and therefore no direct implications are apparent. Two of the participants who fell into this category are also the two who indicated that they use ASL for instruction. One thing that all three of these participants have in common is that they are teaching the same group of students all day, two as Florida School for the Deaf and the Blind teachers and one as a self-contained teacher in the district. No analyses were run for this dimension as it was not a dependent variable, but may warrant inclusion as a factor in future research on this topic.

After analyzing the data both quantitatively and qualitatively, very little can be interpreted for use in practice. While the statistical results indicated a difference in how these respondents answered the questions in the extensions variable, the difference was not apparent upon review of the actual responses. None of these respondents left comments on these questions.

The follow-up observations did not uniformly support the responses of the participants; however, neither did they undermine them. The structure of the lessons observed did not lend itself to use of these particular strategies. It is entirely possible that given a different lesson, these strategies would have been observed in use by all of the teachers. It is also possible that classroom management demands (e.g., student characteristics and levels, curriculum requirements) affected the teachers' decision to structure the lesson in the way

that they did. While few instances of use were observed, no missed opportunities to use them were observed, either.

Future Research

Future research on this topic should be undertaken through observations. The majority of participants in this study reported that they use the four language facilitation strategies; however, there was no way to corroborate this. If teachers of the deaf are in fact using these strategies, then it may indicate that language facilitation practices of teachers is not a factor in the low linguistic achievement of children with hearing loss. If they are not using them, then the question still remains as to whether these strategies facilitate language development in children with hearing loss and would indicate that an intervention study would be appropriate. Another possibility is that teachers of the deaf believe that they are using these strategies to a greater extent than what they really are. Again, the only way to know which one is the case is to actually observe teachers teaching. To address this, initial observations could be followed by a debriefing to make the teacher aware of the extent to which she actually uses the strategy. This could be treated as an intervention by then doing additional observations and measuring any change in the frequency the strategies are used.

Future research on this topic should also take into consideration the competing demands that teachers must consider when designing and delivering a lesson. Some of the comments the participants contributed related to the need to regulate the behavior of their students. One participant was very vocal about the competing demands that are placed on her that interfere with her ability to

plan ideal lessons. For example, her time with the students is limited and the administration has specific ideas about how she should structure the time she does have.

The results obtained suggest that years of experience and communication modality used may be factors that influence a teachers' use of the strategies, specifically that of extensions. While not statistically significant, the data also suggested that job responsibility (e.g., itinerant, self-contained, resource) had some influence on how the participants responded to the items. These factors should be a focus in future research to identify if they do interact with the use of the strategies and if they have any predictive relationship with it.

Summary

The purpose of this study was to report the extent to which teachers of the deaf report using the language facilitation strategies of recasting, extensions, responsivity, and self-talk/parallel-talk. A 25-item questionnaire was developed to explore this topic. Statistical analyses of the data were inconclusive. The significant statistical results obtained were only suggestive when viewed in combination with the qualitative analysis. The number of limitations of the study severely inhibited any implications for practice.

The teachers who participated in this study, through their comments, displayed a high degree of knowledge about instruction and classroom management. They demonstrated their commitment to the achievement of students with hearing loss and that they do have an understanding of the importance of language development for this group of students. All of the points

of importance of this dissertation are summed up in one comment left for the item “I focus on science during science lessons and language during language lessons: “Science is language. This question doesn’t make sense.”

Future research on this topic should also be sensitive to the variety of factors that teachers have to consider and plan for or around. It is a practical issue that may interfere with a teacher’s ability to use research-based practices. Careful observation of teachers should be undertaken across multiple days and times to obtain a clearer picture of the extent to which teachers use these strategies. Post-observation debriefings may also be used as an intervention to make the teacher aware of the actual extent to which she is using the strategy, and then measure any change after the meeting. Years of experience teaching, communication modality, and job responsibility should be included as independent variables.

The language learning outcomes of students with hearing loss has remained relatively constant for over 100 years. Despite new philosophies and communication options, students with hearing loss continue to experience delayed language. Great gains have been made in hearing aid technology and early intervention techniques which have contributed to the success of many children with hearing loss; however, there are still many children who do not achieve age-appropriate language or academic levels commensurate with their hearing peers. The role that specific strategies play in the linguistic development of students with hearing loss in an educational setting is an unexplored area and warrants further research.

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APPENDIX A

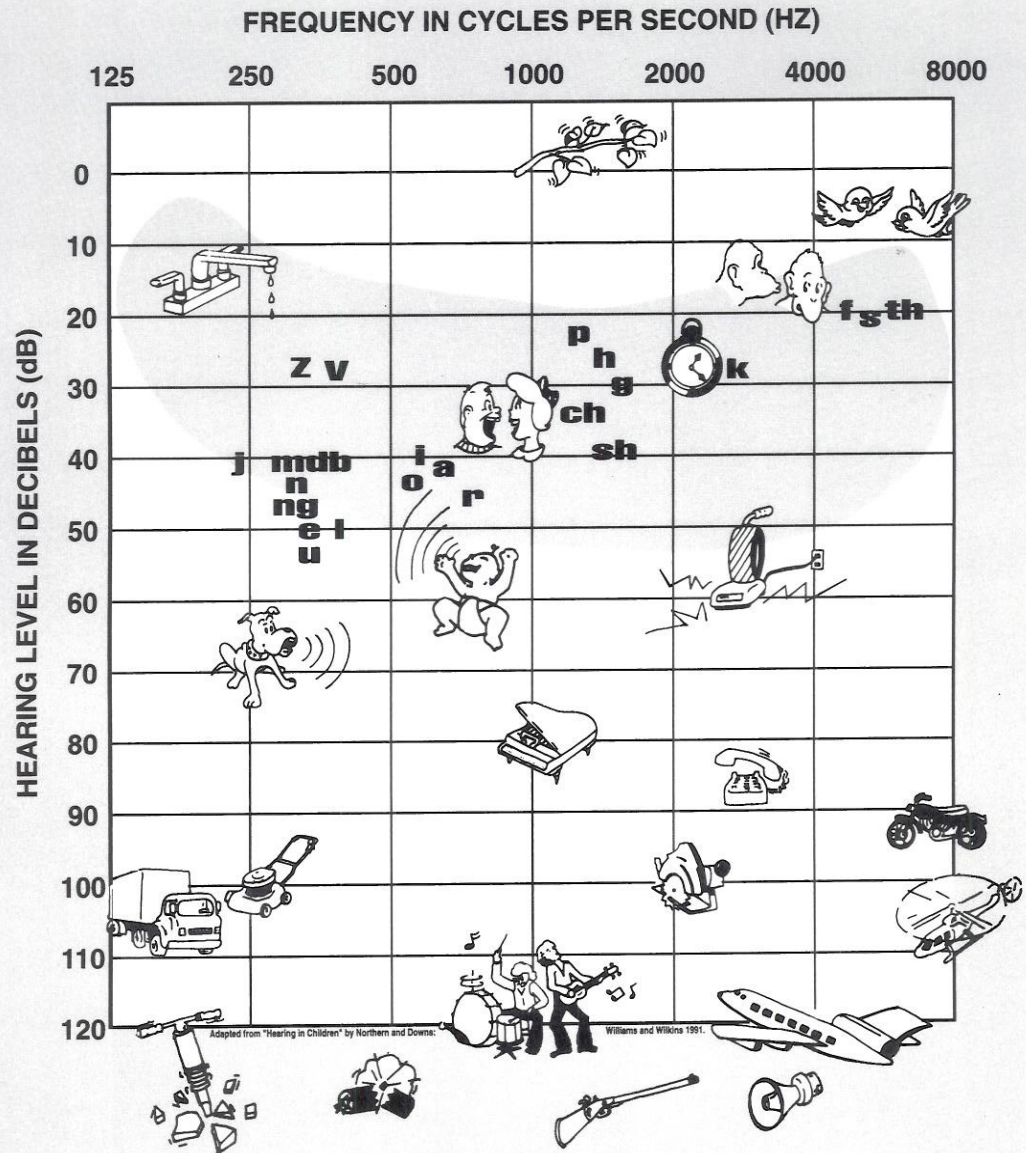
COMMUNICATION SYSTEMS

Communication Systems	Description
Rochester Method	Named after the school where the then superintendent, Zenas Westervelt, instituted a rule requiring that all communication be through fingerspelling and speech only, the Western New York Institution for the Deaf Mutes, now known as the Rochester School for the Deaf. The method does not allow for any gesturing or signs of any kind (Castle, 1974).
Seeing Essential English	Created by David Anthony in 1966. He was a deaf man who worked with children who were both deaf and cognitively disabled. It was created to represent all parts of English, including bound morphemes, on the hands and to provide a distinct sign for each word. The latter was accomplished by adopting ASL signs, but producing the sign with the first initial of the word (Luetke-Stahlman & Milburn, 1996). For example, the ASL sign for MAKE would be produced with "P" handshape to mean produce and with a "C" handshape to mean create. Compound words were broken down into separate signs. Words that sound alike have the same sign.
Signing Exact English	Created by Gustason, Zawolkow, and Pfetzing 1972. Very similar to Seeing Essential English. Is not as strict about using signs for all morphemes and ASL signs are used for compound words (Paul, 2001).
Cued Speech	Created by R. Orin Cornett, Ph.D., in 1966 at Gallaudet University. Consists of eight different handshapes that are used in four different locations around the face to visibly represent speech sounds that are either not visible on the lips, or to differentiate two speech sounds that appear the same on the lips. It is used in conjunction with spoken English (Streng et al., 1978).
American Sign Language	ASL is a distinct language. It is comprised of handshapes that are produced on and around the body. Many of the grammatical features are represented on the face and in how the sign is produced (e.g., slow or fast, small or big). It evolved out of the combination of French Sign Language brought over by the first teacher of the deaf in America and indigenous signing used by groups of deaf people in America (Paul, 2001).
Total Communication	This term is a very broad term used to describe various combinations of different languages and systems. It uses a combination of signs and spoken English. The signing may be English based signs or ASL signs (Paul, 2001). It is also thought of as any means that works for the child, and simultaneous communication (Paul, 2001).

APPENDIX B

AUDIOGRAM OF FAMILIAR SOUNDS

AUDIOGRAM OF FAMILIAR SOUNDS



APPENDIX C

**COUNCIL ON THE EDUCATION OF THE DEAF
STANDARDS FOR TEACHERS
OF THE DEAF**

Standard	Knowledge	Skills
Foundations	DH1K1 Incidence and prevalence figures for individuals who are deaf and hard of hearing.	DH1S1 Explain historical foundations and research evidence upon which educational practice is based.
	DH1K2 Sociocultural, historical, and political forces unique to deaf education.	DH1S2 Develop and enrich cultural competence relative to the Deaf community.
	DH1K3 Etiologies of hearing loss that can result in additional learning challenges.	
Development and Characteristics of Learners	DH2K1 Cognitive and language development of individuals who are deaf and hard of hearing.	
Individual Learning Differences	DH2K2 Effects of the interrelationship among onset of hearing loss, age of identification, and provision of services on the development of the individuals who are deaf or hard of hearing.	
	DH3K1 Influence of experience and educational placement on all developmental domains	DH3K2 Influence of cultural identity and language on all developmental domains.
Instructional Strategies	DH4K1 Visual tools and organizers that support content mastery and retention by individuals who are deaf or hard of hearing.	DH4S1 Develop proficiency in the languages used to teach individuals who are deaf or hard of hearing.

Standard	Knowledge	Skills
Instructional Strategies, cont.		DH4S2 Provide activities to promote print literacy and content area reading and writing through instruction via spoken language and/or the signed language indigenous to the Deaf community.
		DH4S3 Apply first and second language teaching strategies to the instruction of the individual.
		DH4S4 Provide balance among explicit instruction, guided instruction, peer learning, and reflection.
Learning Environments/Social Interactions	DH5K1 Influence of family communication and culture on all developmental domains	DH5S1 Provide ongoing opportunities for interactions between individuals who are deaf or hard of hearing with peers and role models who are deaf or hard of hearing.
		DH5S2 Provide access to incidental language experiences.
		DH5S3 Prepare individuals who are deaf or hard of hearing to use interpreters.
		DH5S4 Manage assistive technology for individuals who are deaf or hard of hearing.

Standard	Knowledge	Skills
Learning Environments/Social Interactions, cont.		DH5S5 Design a classroom environment that maximizes opportunities for visual and/or auditory learning and meets developmental and learning needs.
Language	DH6K1 Components of linguistic and non-linguistic communication.	DH6S1 Apply strategies to facilitate cognitive and communicative development.
	DH6K2 Importance of early intervention to language development.	DH6S2 Implement strategies for stimulating and using residual hearing.
	DH6K3 Effects of sensory input on the development of language and learning.	DH6S3 Facilitate independent communication in all contexts.
	DH6K4 Spoken and visual communication modes.	DH6S4 Communicate proficiently in spoken language or the Sign Language indigenous to the Deaf community.
	DH6K5 Current theories of the development of spoken language and signed languages.	DH6S5 Implement strategies for developing spoken language in orally communicating students and sign language proficiency in signing students.
Instructional Planning	DH7K1 Model programs for individuals who are deaf or hard of hearing.	DH7S1 Use specialized technologies, resources, and instructional strategies unique to students who are deaf or hard of hearing.
		DH7S2 Plan and implement transitions across service continuums.

Standard	Knowledge	Skills
		DH7S3 Integrate language instruction into academic areas. DH7S4 Plan instruction to address academic content standards. DH7S5 Develop successful inclusion experiences.
Assessment	DH8K1 Specialized terminology used in assessing individuals who are deaf or hard of hearing.	DH8S1 Administer assessment tools using the students preferred mode and language of communication. DH8S2 Develop specialized assessment procedures that allow for alternative forms of expression. DH8S3 Collect and analyze spoken, signed, or written communication samples.
Professional and Ethical Practice	DH9K1 Roles and responsibilities of teachers and support personnel in educational practice for individuals who are deaf or hard of hearing. DH9K2 Professional resources relevant to the field of education of individuals who are deaf or hard of hearing.	DH9S1 Participate in activities of professional organizations in the field of deaf education. DH9S2 Increase proficiency and sustain a life-long commitment to maintaining instructional language competence.
Collaboration	DH10K1 Services, organizations, and networks that support individuals who are deaf or hard of hearing.	DH10S1 Provide families with support to make informed choices regarding communication modes, philosophies, and educational options.

Retrieved from <http://councilondeafed.org/standards2.html>

APPENDIX D

DEAF EDUCATION TEXTBOOKS REVIEWED

 Deaf Education Textbooks Bibliography

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APPENDIX E

QUESTIONNAIRE

Dear Teachers of the Deaf:

I am a doctoral student in Special Education at the University of Northern Colorado. For my dissertation, I am conducting a study to collect information on how teachers of the deaf facilitate language development in the classroom. If you are a certified teacher of the deaf currently working with children with hearing loss of any age, I am inviting you to participate by completing a brief questionnaire.

The questionnaire will take approximately 10 minutes to complete. The questionnaire is online and your responses will be stored electronically. I am not asking for any identifying information so your responses will be totally anonymous. Only my research advisors and I will have access to the data. There are no foreseeable risks to you for taking this survey. The questions are related to things you do every day as part of your job as a teacher of the deaf, and, again, your participation is totally anonymous.

As appreciation for your time, upon completion of the questionnaire you may elect to be entered into a drawing for one of three \$50 VISA gift cards. At the end of the study, there will be a link that will take you to another "questionnaire." There you can enter your name and contact information for the drawing and the information will not be attached to your questionnaire responses.

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to

which you are otherwise entitled. Having read the above and having had an opportunity to ask any questions please complete the questionnaire if you would like to participate in this research. By completing the questionnaire, you will give us permission for your participation. You may keep this form for future reference. If you have any concerns about your selection or treatment as a research participant, please contact the Office of Sponsored Programs, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-2161.

By clicking "next," you are giving your consent for participation in the survey. You may request the results of the survey by emailing me at the address below.

Thank you for your time!

Michele Handley, M.Ed.

hand1867@bears.unco.edu

Research advisors:

Kay A. Ferrell, Ph.D.

Sandy Bowen, Ph.D.

970-351-2691

Part 1: Background information

1. Gender: Male _____ Female _____
2. How many years have you worked as a teacher of the deaf? _____
3. What is your highest degree earned?
_____ Bachelor's

_____ Master's
_____ Doctorate
Other _____

4. Which category best describes your current job responsibilities?

_____ Itinerant teacher
_____ Resource teacher
_____ Self-contained teacher
Other _____

5. What grade level do you primarily teach? _____

If you teach other grades, what are they? _____

6. How would you describe your primary means of communication for instruction? (Choose the one that best matches what you use.)

_____ American Sign Language
_____ Spoken English only
_____ Total Communication (a combination of signs and spoken English)

Part 2: Practices

Please rate how well the following list of statement describes what you do with your students. There are no right or wrong answers.

1	2	3	4
Never or almost never true of me	Usually not true of me	Usually true of me	Always or almost always true of me

1. Most of my lessons are set up so that students have an opportunity to do an activity.
2. I model language by repeating my students' own words/signs back to them.
3. I teach my students content material and the speech-language-pathologist teaches them language.
4. If a student says/signs something, I wait until later to offer correction so as not to disrupt a lesson.
5. I have my students tell me about their experiences then I write what they say in English.
6. I respond to my students when they try to talk to me, even if they are just gesturing or making a noise.
7. When I am teaching, I acknowledge students' comments, but keep the lesson moving.
8. I focus on supporting the language development of my students throughout the day.
9. I put words on what my students are doing to make a connection for them between their actions/feelings and language.
10. I encourage my students to write about their own experiences so that they can read it again to reinforce their language development.

1	2	3	4
Never or almost never true of me	Usually not true of me	Usually true of me	Always or almost always true of me

11. I make time to just chat with my students.

12. I like to choose the topic when chatting with my students.

13. I encourage students to make their own connections between their actions/feelings and language.

14. I design lessons and activities that allow my students to talk with each other.

15. When a student says/signs something incorrectly, I model the correct way to say it and then expand on what they said.

16. I teach my students new words/signs when opportunities come up, even if it is not during instruction time.

17. When a student says/signs something incorrectly, I repeat it back in a grammatically correct way.

18. When chatting with my students, we talk about whatever they want to talk about.

19. I use the student's own writing for reading instruction.

20. I focus on science during science lessons and language during language lessons.

21. I say my thoughts out loud to model the thinking process for my students.

1	2	3	4
Never or almost never true of me	Usually not true of me	Usually true of me	Always or almost always true of me

22. I incorporate ways of helping my students develop their language into all subject areas.

23. When I am teaching a lesson, I do most of the talking.

24. I incorporate language objectives into all of my lessons.

25. During instruction with my students, I repeat what they say but use different words/signs to say the same thing to expose them to new vocabulary.

Part 3: Additional Comments

What else do you do to promote language development?

APPENDIX F

**MEANS AND STANDARD DEVIATIONS FOR
EACH INDEPENDENT VARIABLE BY
EACH DEPENDENT VARIABLE**

Independent Variables	Dependent Variable															
	Recast		Extensions		Responsivity		Self/parallel-talk		Conversation		Language all day		Language is priority		Extraneous	
	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD
Years of Experience:																
Novice (0-2) (n=5)	3.20	.380	2.73	.434	3.33	.333	2.80	.298	3.00	.527	3.20	.380	3.26	.435	2.60	.518
New (3-5) (n=3)	3.33	.000	3.44	.509	3.00	.000	2.67	.000	3.00	.333	3.56	.192	3.44	.694	2.67	.289
Experienced (6-15)(n=27)	3.03	.474	2.65	.375	3.11	.381	2.78	.358	2.94	.414	3.46	.383	3.25	.520	2.81	.488
Seasoned (16-25)(n=8)	2.88	.396	2.54	.248	3.00	.309	2.75	.345	3.00	.356	3.46	.173	3.33	.504	2.91	.376
Expert (26-38)(n=14)	3.10	.332	2.60	.417	3.31	.402	2.90	.275	3.05	.469	3.60	.325	3.60	.325	2.89	.516
Level of Education:																
Bachelor's (n=28)	3.11	.426	2.69	.444	3.15	.307	2.75	.322	2.87	.419	3.45	.342	3.38	.451	2.77	.408
Master's (n= 27)	3.02	.413	2.64	.402	3.15	.447	2.83	.325	3.10	.390	3.47	.361	3.30	.518	2.85	.538
Doctorate (n=0)	0.00	.000	0.00	.000	0.00	.000	0.00	.000	0.00	.000	0.00	.000	0.00	.000	0.00	.000
Other (n=2)	2.83	.236	2.83	.236	3.33	.000	3.00	.000	3.00	.471	3.83	.236	3.83	.236	3.13	.177
Grade Level Taught:																
Birth-prek (n=3)	3.22	.509	2.89	.385	3.22	.192	3.00	.333	3.22	.509	3.67	.000	3.56	.770	3.00	.433
Elementary (n=22)	3.14	.366	2.64	.355	3.18	.433	2.82	.224	2.98	.442	3.44	.332	3.36	.384	2.80	.515
Middle (n=9)	2.96	.389	2.81	.556	3.07	.364	2.74	.324	2.89	.333	3.52	.338	3.52	.338	2.83	.331

Dependent Variable

Independent Variables

	Recast		Extensions		Responsivity		Self/parallel-talk		Conversation		Language all day		Language is priority		Extraneous	
	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD
Grade Level																
Taught:																
Middle (n=9)	2.96	0.389	2.81	0.556	3.07	0.364	2.74	0.324	2.89	0.333	3.52	0.338	3.52	0.338	2.83	0.331
High (n=15)	2.89	0.371	2.6	0.382	3.27	0.258	2.78	0.411	3	0.418	3.44	0.43	3.09	6.23	2.73	0.555
K-12 (n=8)	3.21	0.562	2.67	0.504	2.96	0.415	2.79	0.396	2.96	0.452	3.5	0.356	3.58	0.296	2.97	0.339
Communication																
Modality:																
ASL (n=2)	3.33	0	3.5	0.707	3	0	2.67	0	3.17	0.236	3.5	0.236	3.83	0.236	2.75	0.354
Spoken English (n=6)	3.28	0.491	2.5	0.548	3.11	0.689	3.06	0.251	2.89	0.621	3.5	0.35	3.5	0.35	2.75	0.725
Total																
Communication (n=49)	3.02	0.405	2.66	0.357	3.17	0.334	2.78	0.322	2.99	0.397	3.47	0.36	3.32	0.495	2.83	0.466

APPENDIX G

INSTITUTIONAL REVIEW BOARD APPLICATION

A.Purpose

1. The purpose of this research is to collect information that describes the use of specific strategies by teachers of the deaf that may support the language development of school-aged students with hearing loss based on teachers' self-report. It is widely accepted within the field that language development is the priority of teachers of the deaf (Easterbrooks & Baker, 2002; Kretschmer & Kretschmer, 1995; Miller & Luckner, 1992; Pinter & Paterson, 1916). Most children with hearing loss are born to hearing parents (Mitchell & Karchmer, 2004) and do not have immediate and unimpeded access to the communication and language used in their families. This results in language delay that is often not remediated until the child enters school (Rose, McAnally, & Quigley, 2004). However, there is a paucity of research regarding effective language facilitation practices with these students (Marschark, 2001). The majority of strategies that are recommended are based on the literature on typically developing children (Singleton & Morgan, 2006). Four strategies that are recommended for use with students with hearing loss were identified for this study based on the presence of some data to support their use with this population. The goal of this study is to use teachers' self-reporting to identify if they are using these four strategies and to what extent. Responses will also be analyzed for trends or relationships regarding response and level of education, years of experience, grade level taught, and communication modality used.

2.Exempt- The research being proposed is a survey that will rely on self-selection of participants. There will be no identifying information collected and the topic is not likely to cause harm. The information being collected is routine classroom instructional practices. The participants are all adults. At the end of the survey, participants may elect to provide their name and contact information if they would like their name to go into a drawing to win one of three \$50 VISA gift cards. Their identifying information will not be attached to their responses.

B.Participants

1.Sampling- Participants will be invited to participate via notifications in two electronic methods. The first is an electronic newsletter managed by the Resource Materials and Technology Center (RMTC) which is part of the support network for school districts in Florida who have hearing loss. *Tech Notes* is distributed monthly and currently has over 800 subscribers, not all of whom are teachers of the deaf. Information is not kept regarding the profession of the subscribers so potential respondents are unknown. The second method is the *News* function of the internal email system at the Florida School for the Deaf and for the Blind (FSDB). This is an electronic bulletin board that all FSDB employees have access to. There are currently 64 teachers of the deaf employed at FSDB who are working as teachers. Many of the positions on campus require teaching certification; however, targeted participants are those who currently provide instruction to students. Teachers will self-select to participate.

Additional notifications will be posted to both sites until the desired number of respondents is obtained (49 respondents). The completion of the questionnaire is tacit consent for participation. A statement will be included at the beginning of the questionnaire advising participants that they may discontinue the survey at any time and may choose to not submit completed surveys.

Sample size-There is no state-wide database of teachers of the deaf currently working in Florida. Neither is information available about the subscribers to the *Tech Notes* newsletter. Only the potential respondents contacted through the internal *News* at FSDB is known. Therefore, the total number of potential respondents is unknown. For statistical significance at the .05 level, a response rate of 49 is needed. This will yield an effect size of .25.

Participant Characteristics- The target population for this study is teachers of the deaf currently working as classroom teachers in the state of Florida. This is not a vulnerable population. No other limitations are being placed on participation to collect as much information as possible. Students with hearing loss of all ages exhibit language delays and may, therefore, benefit from the use of facilitation strategies. Additionally, the strategies identified for this study are applicable to students who sign or use speech.

2.Data Collection Procedures. The survey will be administered via UNC's online survey tool, Qualtrics. These are the only data that will be

collected. No form of deception will be used. Participants will be informed that they may request survey results by emailing a request to the author.

3.Data Analysis Procedures. Response categories will be analyzed by assigning each response option with a numerical value between 1 and 4.

Descriptive statistics of frequency, mean, median, mode and standard deviations will be calculated, and response rates will be reported.

Cronbach alpha will be used to analyze internal consistency and multivariate analysis of variance (MANOVA) will be used to identify relationships between the endorsement of an item and the teacher's level of education, years of experience, grade level taught, communication modality used. To obtain significance at the .05 level, a response rate of 49 is needed.

4.Data Handling Procedures. Data will be collected and stored electronically. Access to the data will be limited to the author and her research advisors. Completed surveys will be assigned a number in order of receipt. Personally identifiable information will be collected only if the participant wishes to be included in the drawing for one of three \$50 VISA gift cards. This information will not be attached to the completed survey. Demographic information will not include any information that can be traced back to the participant (e.g., years of experience, level of education, grade level taught, communication modality used, and type of teaching).

C.Risks, Discomforts, and Benefits

There are no foreseeable risks to this study. It is a survey delivered in an anonymous format where participants will self-select. There will be no pressure to participate and no social component to risk stigma or other judgment. The information being sought is that which the participants will deal with in the daily course of their jobs and should not produce any stress to report on. Participants will not benefit directly from participation. The benefits will be to the field of deaf education with the possibility of informing future teacher training and research.

D.Costs and Compensations

Participants will be given the opportunity to enter themselves into a drawing to win one of three \$50 VISA gift cards. As the survey is being distributed and collected electronically, there are no associated costs to the researcher or the participants.

APPENDIX H

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER



Institutional Review Board

DATE: March 18, 2013

TO: Candace Handley
FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [434311-2] Use of strategies to facilitate language Development in students with hearing loss: Teachers' report

SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVAL/VERIFICATION OF EXEMPT STATUS

DECISION DATE: March 18, 2013

Thank you for your submission of Amendment/Modification materials for this project. The University of Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB regulations.

Thank you for providing a consent form. It has all of the necessary information. Please be sure to use this form as the first document that your potential participants view in your data collection.

Your IRB application is now verified/approved exempt and you may begin data collection. Don't hesitate to contact me if you have any IRB-related questions or concerns.

Best wishes with your research.

Sincerely,

Dr. Megan Stellino, UNC IRB Co-chair

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Sherry May at 970-351-1910 or Sherry.May@unco.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.

APPENDIX I

INFORMED CONSENT LETTER

Dear Teachers of the Deaf:

I am a doctoral student in Special Education at the University of Northern Colorado. For my dissertation, I am conducting a study to collect information on how teachers of the deaf facilitate language development in the classroom. If you are a certified teacher of the deaf currently working with children with hearing loss of any age, I am inviting you to participate by completing a brief questionnaire.

The questionnaire will take approximately 10 minutes to complete. The questionnaire is online and your responses will be stored electronically. I am not asking for any identifying information so your responses will be totally anonymous. Only my research advisors and I will have access to the data. There are no foreseeable risks to you for taking this survey. The questions are related to things you do every day as part of your job as a teacher of the deaf, and, again, your participation is totally anonymous.

As appreciation for your time, upon completion of the questionnaire you may elect to be entered into a drawing for one of three \$50 VISA gift cards. At the end of the study, there will be a link that will take you to another "questionnaire." There you can enter your name and contact information for the drawing and the information will not be attached to your questionnaire responses.

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Having read the above and having had an opportunity to ask any questions please complete the questionnaire if you would like to participate in this research. By completing the questionnaire, you will give us permission for your participation. You may keep this form for future reference. If you have any concerns about your selection or treatment as a research participant, please contact the Office of Sponsored Programs, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-2161.

By clicking "next," you are giving your consent for participation in the survey. You may request the results of the survey by emailing me at the address below.

Thank you for your time!
Michele Handley, M.Ed.
hand1867@bears.unco.edu

Research advisors:
Kay A. Ferrell, Ph.D.
Sandy Bowen, Ph.D.
970-351-2691

APPENDIX J

**CONSENT TO DISTRIBUTE QUESTIONNAIRE
RESOURCE MATERIALS AND
TECHNOLOGY CENTER**


Printed by: Michele Handley 2401
Title: for Tech Notes : Staff Email

Tuesday, January 22, 2013 4:46:01 PM
Page 1 of 1

From:  **Shelley Ardis 2661** Tuesday, January 22, 2013 4:45:39 PM  

Subject: for Tech Notes

To:  **Michele Handley 2401**

Cc:  Kay Ezzell 2684

Michele,

I am writing to confirm permission for you to send out an invitation for teachers of the Deaf/Hard-of-Hearing to participate in your study, being done for your graduate work. You can submit the information to go out on the Tech Notes listserv to Kay Ezzell. Via email, communicate with Kay about your timelines and content. For example, do you want the opportunity to go out just once or a few times over the next few months? Would it be best to go out as a special announcement?

Good luck,
Shelley

Shelley Ardis
Executive Director of Technology Services
Florida School for the Deaf and the Blind

904-827-2666

ardiss@fsdb.k12.fl.us

<http://technology.fsdb.k12.fl.us>

Like Us on Facebook <http://www.facebook.com/FloridaDeafandBlind>



Like Me on Facebook - Mrs. Shelley Ardis

APPENDIX K

**CONSENT TO DISTRIBUTE QUESTIONNAIRE
FLORIDA SCHOOL FOR THE DEAF AND
THE BLIND INTERNAL NEWS**

Printed by: Michele Handley 2401
Title: Re: survey : Staff Email

Tuesday, January 22, 2013 2:05:40 PM
Page 1 of 1

From:  Cindy Day 2221
Subject: Re: survey
To:  Michele Handley 2401

Tuesday, January 22, 2013 2:02:52 PM 

Michele Handley 2401 writes:

Cindy,

I would like permission to send out a notice on our News to invite our Teachers of the Deaf to participate in a survey for my dissertation. The survey will be approximately 20 questions and will be conducted via an internet survey instrument. The questions will be aimed at identifying what practices they use in the classroom to help develop language skills. Those wanting to participate will simply click on a link that will be in the email and it will take them to the survey. Participants will be entered into a drawing for one of three gift cards.

Thank you!
Michele

Michele,
This was approved by the President's Advisory Team (PAT) on 12/17/2013. We wish you success!
Cindy Day
Executive Director of Parent Services