The Report Committee for Holly Vera Chen
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Pragmatic Skills Intervention: Understanding Pragmatic Differences, Communication Breakdown Management, Peer & Self Attitudes and Perceptions in Children with Hearing Loss

APPROVED BY
SUPERVISING COMMITTEE:

Supervisor:

Barbara L. Davis

Angela A. Carey

Pragmatic Skills Intervention: Understanding Pragmatic Differences, Communication Breakdown Management, Peer & Self Attitudes and Perceptions in Children with Hearing Loss

by

Holly Vera Chen, B.S.C.S.D.

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Dedication

For my family, friends and professors who've encouraged me every step of the way. I wouldn't have accomplished all that I have without your gracious patience and compassionate hearts. This is for you.

Abstract

Pragmatic Skills Intervention: Understanding Pragmatic Differences, Communication Breakdown Management, Peer & Self Attitudes and Perceptions in Children with Hearing Loss

Holly Vera Chen, M.A.

The University of Texas at Austin, 2014

Supervisor: Barbara L. Davis

This purpose of this study was to examine pragmatic differences in children with hearing loss compared to children without hearing loss by understanding use of communication repairs, self and peer attitudes and perceptions to suggest the most appropriate intervention approaches. Previous research has found use of communication repairs, self and peer perceptions and attitudes to be associated with pragmatic skills. Intervention approaches were suggested for remediating pragmatic differences in children with hearing loss.

Table of Contents

List of Tables

List of Figures

Introduction

For every 1,000 children born in the United States there are about 2 to 3 children born deaf or hard-of-hearing (National Institute on Deafness and Other Communication Disorders, 2010). With incorporation of newborn hearing screening protocols, more children are enrolled in early intervention programs that promote inclusion of children with developmental differences into mainstream classrooms where children with hearing loss are entering classrooms with peers who do not have hearing loss. Increased exposure to peers without hearing loss may create more opportunities for social interaction using oral language; however, many children with hearing loss may not have the skills to succeed (Martin et al., 2010). The purpose of this study is to examine how pragmatic or social skills are expressed in children with hearing loss. A review of available research on peer entry success, management of communication breakdowns and self and peer perceptions and attitudes in children with hearing loss will be employed to discover relevant factors in choosing intervention approaches. Each of the three factors above are examined as the patterns of children with hearing loss are compared with children without hearing loss to distinguish challenges that are specific to children with hearing loss and ways to remediate them.

Hearing loss affects individuals differently. These differences may be dependent but not limited to the type, degree, duration of hearing loss, type and length of use of hearing device, languages exposed and use, and parental hearing status (Eriks-Brophy & Whittingham, 2013). Previous researchers have found that that children with hearing loss

used less diverse communication repair strategies, exhibited lower self-esteem (i.e., and more difficulty entering established peer-groups compared to hearing children (Martin et al., 2010; Most et al., 2010; Brooks & Ellis, 1982). Differences in these crucial social skills may be preventing children with hearing loss from developing successful social relationships impacting their psychological, academic, and personal performance and social acceptance (Ladd 2005 as cited in Martin el al., 2010). Overall, individuals with hearing loss are widely diverse. This diversity limits the generalization of outcomes across to all individuals with hearing loss. Moreover, the term 'hearing loss' is used throughout this paper to broadly describe individuals with various types and degrees of hearing loss unless specified. Use of person first description (i.e. a person with hearing loss) is preferred and will replace descriptions like hearing impairment, a hearing impaired person or hard of hearing individual. Person first language is preferred because it does not limit the individual to his or her abilities. Hence, individual differences and experiences need to be taken into consideration when evaluating and selecting most appropriate intervention approaches.

Furthermore, little research has been done to examine interventions and intervention effectiveness in teaching social skills to children with hearing loss. Lack of available and current research hinders school speech language pathologists in making decisions related to providing appropriate and adequate services for children with hearing loss. Therefore, the goal of this report is to examine pragmatic abilities in children and adolescents with hearing loss by investigating 3 crucial factors that contribute to social behaviors and use: peer entry, communication breakdown management, and peer and self

attitudes and perceptions. Understanding the impact of each factor and its effects on pragmatic use and expression in children with hearing loss will provide insight to how pragmatic strengths and weaknesses are manifested and strategies to enhance social abilities.

Pragmatics

With the increasing growth of inclusive classrooms, all children are more exposed to children with diverse abilities and needs. Not only are children more likely to know other children with special needs, children with special needs are given an opportunity to interact and develop social relationships with other peers. Opportunity, exposure and integration of all children will advance greater social inclusiveness in our ever-changing society. Developing meaningful social relationships at a young age is pertinent to the child's development. The advantage of having meaningful social relationships go far beyond immediate social benefits, often creating long-lasting effects. Greater psychological well-being, better academic performances, healthy emotional regulations are all associated from having meaningful social relationships (Ladd 2005 as cited in Martin el al., 2010). Understanding the function and use of social behaviors are necessary to foster social relationships.

Pragmatics or social abilities include understanding of social rules and regulations during interactions between speakers (Goberis et al, 2012). Pragmatic behaviors include turn taking, maintaining on topic, adding information, and asking questions during conversations. However, pragmatic abilities are not limited to the content of the spoken language but also include the use of appropriate verbal and nonverbal modes of communication in the broad context of the interaction such as time, place, circumstances, speaker, and listener (Levinson, 1983; Most et al., 2010). While acquisition of social skills occurs over time and experience, children with hearing loss have been found to be

less skillful at maintaining topics, and needing more instructions compared to their hearing peers (Most et al., 2010). It has been postulated that the differences found in pragmatic skills in children with hearing loss may be related to their speech and language delays and difference in linguistic and experiential exposures.

Moreover, little research has been done to examine how children with hearing loss interact and socialize with their peers without hearing loss in the inclusive classroom. In fact, little to no research has been done to examine longitudinal effects of how social abilities support optimal development in children with hearing loss over time. Current research suggested that children with hearing loss suffer from social interactions and difficulties. Understanding the nature of these difficulties will help to alleviate short-term challenges from becoming long-term deficits hindering optimal well-being and quality of life.

One of the most important indicators that reveal social competence is peer entry success (Boyd, Knutson, & Dahlstrom, 2000). The ability for a child to enter a group of peers successfully is a powerful indicator of how he or she will be accepted within the group. Martin et al. (2010) examined the associations between cochlear implant related variables, psychological variables and ability to interact with children without hearing loss under two peer task conditions. The first condition (dyadic peer group entry) required the child with congenital severe to profound hearing loss to interact with a child without hearing loss for 30 minutes. The second condition (triadic peer group entry) required the child with hearing loss to enter a group of two children without hearing loss who had already interacted for 5 minutes, for 25 minutes.

A total of ten children ages 5 to 6 were recruited through the Cochlear Implant Center at New York University Medical Center. All children had congenital severe to profound hearing loss with no other disabilities and were cochlear implant users for at least a year. Eight of the ten children attended mainstream or inclusive classrooms while two children attended a school for deaf and hard-of-hearing children. The terms 'mainstream' and 'inclusive classrooms' will be used interchangeably throughout this paper. In addition, six more children without hearing loss were recruited to be host peers and interacted with children with hearing loss under the two conditions. The children were paired and matched on age, gender, and socioeconomic status. The children were led to an observation or playroom full of age and gender appropriate toys while the parents were asked to remain outside. The children were introduced to each other then asked to play. No further instructions were given and all sessions were videotaped. The parents were asked to complete *The Child Behavior Scale* (CBS; Ladd & Profilet, 1996) and a demographic questionnaire. The children were asked to complete *The Pictorial Scale of Perceived Competence and Social Acceptance* or PSPCSA (Harter & Pike, 1984), a self-esteem measure, post play session. See Table 1 for behaviors observed and measured during play.

Table 1: Martin et al. (2010), Measure of peer behaviors of children with and without hearing loss by play condition

Measure of peer behaviors by play condition
• Verbalization • Social attention • Solitary constructive • Interaction • Collaborative play • Peer group entry • Entry bids • Success of entry bids • Response to others' bids • New play initiations • Success of initiations • Response appropriate • Communication breakdown • Prosocial Behavior Index (PBI) • Interaction Quality Index (IQI)

In the first condition or the dyadic peer group entry, the authors found no significant difference in entry behaviors in the following groups: 5 children who were deaf with a peer without hearing loss, 6 children without hearing loss with a child with or without hearing loss. Out of the group of 5 children who were deaf, 3 children succeeded in peer entry, one child experienced some difficulty, and one child failed to enter successfully. Out of the group of 6 children without hearing loss, 2 children succeeded in entry, 3 experienced some difficulty and one child did not enter successfully. No significant differences were found in measures of self-esteem in both groups.

Comparing the two conditions, only one child with hearing loss failed to enter the dyadic condition while two children failed to enter the triadic condition. Children with hearing loss were more successful at socializing in the first or dyadic (one-to-one) condition. They spent twice as much time verbalizing, interacting and collaborating with their peers than in the triadic condition. In contrast, children with hearing loss were more likely to engage in solitary activities during the triadic condition. Results suggested that children with hearing loss might have an additional disadvantage called the acoustic effect, which refers to the inability to attend to multiple people at once, secondary to the social effect, which refers to how people may feel pressure and anxiety in entering a pre-established social group (Martin et al., 2010).

In addition, a sex effect was found such that girls displayed higher rates of peer competence and prosocial behaviors than boys. After controlling for sex, both age of implantation and duration of implant uses were strong predictors of social competence in children with hearing loss. Moreover, higher ratings of self-esteem on the PSPCSA were associated with higher scores on the *Interaction Quality Index* (Miller, et al., 2003), higher rates of prosocial behavior (Boyd, Knutson, & Dahlstrom, 2000), and higher rates of peer group entry (Martin et al., 2010).

However, this study had limitations. The biggest limitation was the lack of a control group for the triadic condition, which limited comparisons, and understanding of the results. Other limitations included small sample size, non-randomized sample selection, lack of pre and post measurement of self-esteem, and uneven or unbalanced

number of children without hearing loss paired with children with hearing loss (Martin et al., 2010).

Another study also examined pragmatic skills in children with and without hearing loss (children with cochlear implants vs. children who used hearing aids) in a child-adult interaction (Most et al., 2010). A total of 37 children were recruited. Twenty-four children had hearing loss (11 children with cochlear implants and 13 children with hearing aids) and 13 children were without hearing loss. The group of children with hearing loss all used spoken language and had a mean age of 7.7 years. They studied in mainstream classrooms, had no other disabilities, and received speech therapy twice a week. Children with cochlear implants had a mean degree of hearing loss of 92.3 dBHL or profound hearing loss. Ten were unilateral users and 1 was a bilateral user. Their mean age of implantation was 2.6 years with 5.1 years in mean duration of cochlear implant use. All 13 children with hearing aids were bilateral users with a mean degree of 73.5 dBHL or severe hearing loss in the better ear. These children had a mean age of 7.4 years with no speech, language, hearing or other developmental disabilities according to parent report. The group of children without hearing loss was matched to children with hearing loss on chronological and linguistic age. The mean linguistic age for children with hearing loss was 1.33 with standard deviation of .81 and 1.46 with standard deviation of .78 for children without hearing loss. First, the linguistic subtests were administered to the children by one of the authors. Next, the child and a familiar adult interacted in a room with toys for 15 minutes. The interaction was videotaped for analysis.

Twenty-nine behavior parameters were used to measure the children's pragmatic verbal, paralinguistic and nonverbal communicative abilities. The pragmatic protocol was adapted from Prutting & Kirchner (1987). See Table 2 for the list of behavior parameters.

Table 2: Most et al. (2010), Pragmatic behavior parameters

Verbal aspects	Paralinguistic aspects	Nonverbal aspects
Speech acts 1. Speech act pair analysis 2. Variety of speech acts Topic 3. Topic selection 4. Topic introduction 5. Topic maintenance 6. Topic change Turn taking 7. Initiation 8. Responses 9. Repair/revision 10. Pause time 11. Interruption/overlap 12. Feedback to speakers 13. Adjacency 14. Contingency 15. Quantity/conciseness Lexical selection/use across speech acts 16. Specificity/accuracy 17. Cohesion	Intelligibility and prosody 18. Intelligibility 19. Vocal intensity 20. Vocal quality 21. Prosody 22. Fluency	Kinesics and proxemics 23. Physical proximity 24. Physical contacts 25. Body posture 26. Food/leg and hand/arm movement 27. Gestures 28. Facial expression 29. Eye gaze

The authors found the group of children without hearing loss scored significantly higher on appropriate behaviors than the group of children with hearing loss. Specifically, children without hearing loss scored better than children with cochlear implant and even better than children with hearing aids. In addition, no significant correlation was found between age of implantation and duration of cochlear implant use in children with cochlear implants.

Results further indicated all children with hearing loss were assessed to have inappropriate contingency behaviors. Contingency referred to the behavior of continuing the same topic and adding information to the prior communicative act. All but one child with hearing loss had inappropriate responses and adjacency. Responses referred to responding as a listener to speech acts and adjacency referred to continuing the same topic as a preceding utterance immediately after the partner's utterance. These three parameters were all under the verbal aspects domain. However, no significant difference was found between the groups of children with and without hearing loss in the distribution of inappropriate behaviors across the 3 domains. Moreover, both groups of children demonstrated inappropriate behaviors with highest occurrences in the verbal aspect, followed by paralinguistic aspects then nonverbal aspects.

In general, these results indicated that by age 7 children with hearing loss had presented a wide variety of pragmatic communicative functions; however, they did not master consistent and appropriate use of pragmatic functions compared to their peers without hearing loss. Some of the limitations of this study included small sample size, non-randomized sample selection, ambiguity of coding, coding of appropriate and

inappropriate behaviors instead of only inappropriate behaviors, focus on vocabulary as measurement of linguistic abilities, and lack of child to child comparison. In particular, examination of how children with hearing loss manage verbal or communicative breakdowns over peer entry success could provide greater understanding of their use of pragmatic functions. Martin et al. (2010) anecdotally reported that the distinction between a successful and an unsuccessful play session was the child's ability to manage communication breakdowns.

Communication Breakdown Management

Peer entry success provides access to social interactions while appropriate use of social skills maintains social relations. Entry acceptance into peer group does not provide further information regarding how children will perform within social communication. Specifically, the child's ability to successfully manage communication breakdowns is a factor indicative of their social competence. Examination of management in communication breakdown is warranted to understand the impact of pragmatic skills in children with and without hearing loss.

Communication is a series of back and forth exchange of messages between two or more people. The ability to sustain successful communication or conversation requires one's knowledge and management in the occurrence of communication breakdowns (Ciocci & Baran, 1998). A communication breakdown is when the message was not received or comprehended by the sender. It occurs in various forms such as perceived inadequate volume or loudness, misunderstanding of the message, or inappropriate use of word choice. It is a natural process that occurs across settings and speakers. When a breakdown occurs the listener needs to learn how to request or elicit correct information from the speaker. The speaker, in return needs to learn appropriate repair strategies to ameliorate the breakdown (Most, 2002). There are several types of repair strategies. They can be classified into the following categories: repetition, cue, revision, simplification, addition, spelling, and explanation (Toe & Paatsch, 2010). The type and

number of categories may vary across different studies, but majority of the studies code and classify behaviors into similar categories.

Previous researchers have found that children with severe hearing loss exhibit poor communication management skills (Ciocci & Baran, 1998; Toe & Paatsch, 2010). The children had trouble understanding when a breakdown had occurred (Ciocci & Baran, 1998; Toe & Paatsch, 2010) and how to repair it (Ciocci & Baran, 1998; Toe & Paatsch, 2010). Moreover, some studies have suggested that children with hearing loss may have tried to guess what was said or to change the linguistic input to avoid communication breakdowns (Most et al., 2010). Children with hearing loss may not understand what was said and preferred to behave as if they have not heard the message than to ask for clarification (Most et al., 2010). Differences in communication management require examination to understand how children with hearing loss interact with others.

Some researchers examined how children who are deaf or hard of hearing understand their peers without hearing loss in an inclusive classroom. Toe and Paatsch (2010) examined children's communication abilities through a question-and-answer game context. The format of question-and-answer was innovative and sensitive to examining how children managed the transaction of a conversation. A total of 68 children were recruited from three elementary schools in Melbourne, Australia. The children were between the ages 7 and 12 and were gender and grade matched. Each pair consisted of a child with and without hearing loss. Of the 34 children with hearing loss, 21 were cochlear implant users and 13 were hearing aid users. The range of hearing loss varied

from mild to profound. All 34 of the children were in mainstreamed classrooms and used spoken language.

The game required one child to be the examiner who asked the questions, and one child to be the examinee who repeated the question prior to answering it. The examinee child was given three attempts to repeat the question before answering it. The examinees' answers were coded for verbatim and question accuracy. Observing the child's ability to repeat the question verbatim is indicative that the child had accurately heard the question. In addition, the accuracy of the child's answer showed that he had understood and processed the question that was asked. Table 3 shows the observations made and conditions measured.

Table 3: Toe & Paatsch (2010), Conditions measured in Question-and-Answer game context

Conditions Measured
• Number of questions repeated correctly after first reading • Number of questions repeated correctly after first reading according to question type. • Number of repetitions required. • Number of questions recitation that were unresolved. • Strategies used by the responder in order to seek clarification: general vs. specific • Unprompted clarifications by the questioner • Number of questions answered correctly

Results indicated that on average the group of children without hearing loss was able to repeat the question verbatim after the first reading with 71% accuracy as compared to children with hearing loss who achieved 32% accuracy (Toe & Paatsch, 2010). This finding suggested the group of children without hearing loss found their peers with hearing loss to be intelligible and easily understood as compared to the group of children with hearing loss. The authors suggested the child's ability to repeat the question verbatim was related to their language abilities. They also found that within the group of children with hearing loss, those with average or above average language abilities were more likely to correctly repeat the question verbatim on the first attempt.

Moreover, the results showed that on average the group of children with hearing loss answered more questions correctly (70%) than the group of children without hearing loss (59% accuracy). This finding suggested the group of children with hearing loss might need more repetition and clarification from the examiner than children without hearing loss. Children with hearing loss needed additional support to hear the message but were able to comprehend the message and deliver an appropriate answer. On the other hand, it was confounding that while the group of children without hearing loss was more able to accurately reproduce the question verbatim, they had answer less questions correctly. The authors hypothesized it was possible that the questions presented to the hearing group may have been more difficult.

Comparing the two groups' performance in repeating 'Wh' questions and multiple-choice questions, both groups demonstrated more difficulty in repeating multiple-choice questions. However, children with hearing loss had significantly more

challenge doing so. The authors postulated that multiple-choice questions were longer, more syntactically complex and required more short-term memory ability. It was anecdotally reported that children found it demanding to recite multiple-choice questions straining their working memory. It may be that children with hearing loss had a disadvantage in hearing status and working memory capacities compared to children without hearing loss suggesting teachers could reduce working memory demands on children with hearing loss in their classrooms by using clear, short and direct commands. Reducing cognitive strains on children with hearing loss may allow them to participate and contribute more in the classrooms.

In addition, teaching children with hearing loss how to request specific clarification is pertinent in filling in the gaps of unclear or missed messages. Specifically children with hearing loss were found to use more general clarifications (e.g. "what?" or "say it again") than specific clarifications (Toe & Paatsch, 2010). Increasing their ability to request specific information will decrease the child's cognitive demands thus increase the likelihood of a more successful interaction. Developmentally, repetition is the main repair strategy children use during a communication breakdown however the types and use of repair strategies grow in complexity and diversity as the child's linguistic abilities advances (Ciocci & Baran, 1998). In particular, when children with hearing loss were matched on age and linguistic abilities, children with hearing loss did not exhibit the same level of mastery in pragmatic abilities as compared to their peers without hearing loss (Ciocci & Baran, 1998; Most, 2002).

Ciocci & Baran's (1998) examined how children with and without hearing loss repair communication breakdown by comparing the types and frequency of strategies used under neutral requests for clarification (i.e. "huh?", "what?", and "I didn't understand") and under structured and unstructured conditions. A total of 16 children age 4 to 7 years were recruited. Half of the children had bilateral prelingual profound hearing loss with no other disabilities. All of the 8 children were exposed and used total communication for at least 2 years. The other group consisted of children without hearing loss who had no other disabilities. The children were age and gender matched. All the children were videotaped in a structured elicitation activity using wordless picture books of familiar stories and in an unstructured play activity. The examiner used total communication during interaction with the children. The examiner initiated 10 sets of neutral clarification requests to which the children's repair strategies were coded and classified into the following 6 categories: repetition, revision, addition, cue, discussion, and inappropriate (Ciocci & Baran, 1998). See Table 4 for definitions.

Table 4: Ciocci & Baran (1998), Communication repair categories

Category	Definition
Repetition	Subject repeated all or part of the original utterance. No information was added, and the utterance was not restructured.
Revision	Subject retained the meaning of the utterance, although the grammatical form of the utterance was altered.
Addition	Subject added specific information to the utterance.
Cue	Subject defined terms in the original utterance or provided background information.
Discussion	Subject talked about the conversational repair itself.
Inappropriate	Subject provided unrelated utterances, failed to respond, or attempted to discontinue the sequence

Ciocci and Baran (1998) found that both groups of children recognized when a breakdown occurred and that a response was necessary. Specifically, children without hearing loss were more likely to use repetition, revision or addition for the first neutral request ("huh?"), revisions for the second request ("what?"), and all categories of strategies for the third request ("I don't understand"). On the other hand, children with hearing loss were more likely to use revision for all 3 requests but were less likely to use revision for the third request ("I don't understand"). The three most frequently used types of repair strategies for children with hearing loss were revision, addition and repetition and repetition/revision, addition and cues for children without hearing loss.

The authors postulated that the difference in the frequent use of revision in children with hearing loss might be related to their lack of confidence in delivering the message the first time.

Children with hearing loss might have employed different strategies but they demonstrated awareness, knowledge and skills to repair the breakdown and sustain the social interaction. Therefore, examining only the type or frequency of repair strategies may not be adequate to investigate the quality of the social interaction. Correlation between the type and appropriateness of repair strategies used and the outcome of social interactions have not been studied. In other words, the differences found in repair strategies among children with and without hearing loss was not enough to determine the quality, appropriateness and success of social interactions for children with hearing loss. However, it was crucial that both groups of children were aware of the breakdown and understood that an obligatory response was rendered. Again, there were limitations to this

study including small sample size, non-randomized sample selection, potential bias of having one examiner, groups were not language matched, wide variation in type and degree of hearing loss, and lack of information of specific modes of communication used. Previous studies found that even when children were language matched, children with hearing loss still exhibited different use of pragmatic functions (Most, 2002). Therefore, social behaviors warranted further investigation.

For example, DeLuzio and Girolametto (2011) examined the initiation and response of children with hearing loss during play with children without hearing loss in their inclusive classrooms. According to the authors, examining how children with hearing loss initiate and respond to peers will provide further insight to the experience and quality of interaction between these two groups. Specifically, it may provide greater depth in understanding the precise nature of social difficulties for children with hearing loss.

Choice of initiation approach was a crucial factor in predicting success of a child's group entry. As children transition from solitary and parallel play to cooperative play, more successful peer play requires the child to have cognitive abilities that facilitate play. Children need to understand symbolic gestures and play, and use language skills to demonstrate actions or plans (Guralnick & Weinhouse, 1984). Understanding and use of initiation approaches were pertinent in predicting success of group entry. In fact, children seldom used direct initiation strategies such as seeking direct approval (i.e. "Can I play with you?") especially since it was not effective in gaining acceptance into group entry. Likewise, strategies like waiting and hovering, and disrupting play were all ineffective.

On the other hand, joining in an ongoing group play received the most success for group entry. In fact, most preschool children were unsuccessful on their first attempt but they achieved greater success with persisting and multiple attempts (Corsaro, 1979, 1981, 1985; Dodge et al., 1986; Putallaz & Wassterman, 1990 as cited in DeLuzio & Girolametto, 2011). However, peer entry success was not limited to mere strategy, cognition or language abilities but an inclusion of complex skills like social-emotional awareness, presence of theory of mind, understanding of non-verbal cues (DeLuzio & Girolametto, 2011).

DeLuzio and Girolametto (2011) also conducted a study examining initiation and response in children with and without hearing loss. The authors recruited two groups of 12 children per group. The children, ages 3 to 5, were assessed and matched for intelligence, speech, language, and social development. The groups were divided into children with hearing loss (6 children were cochlear implant users with profound hearing loss and 6 were hearing aid users with severe hearing loss) and children without hearing loss. Children with hearing loss were matched for age, sex, parents' educational level, and number of siblings with a child without hearing loss in their classroom. The children were to play with a set of farm toys for 20 minutes. The interactions were videotaped, coded then analyzed**.** Five different initiation approaches were coded as the following: direct initiation, related activity, unrelated activity, wait and hover, and disruption. Four possible communication modalities were coded as verbal, vocal, gestural or a combination of modalities. Lastly, the initiation outcomes were coded as response, ignore or reject (DeLuzio & Girolametto, 2011).

The authors found no significant difference between the two groups of children in the frequency and modalities used, proportions of responses provided, and mean length of utterance used in peer interactions (DeLuzio & Girolametto, 2011). They found that playmate children (those not involved in study) initiated twice as much interaction with their peers without hearing loss than with their peers with hearing loss. In addition, children without hearing loss received proportionally more responses to their initiations than children with hearing loss even though children with hearing loss used 'related activity' as often as hearing children and 'wait and hover' almost twice as frequently. The authors postulated the use of the 'wait and hover' approach might have been an opportunity for both groups of children to observe and understand the ongoing play activities prior to making any verbal attempts or entries. Either way, it appeared that children with hearing loss were at a disadvantage as their peers without hearing loss were less interested in initiating and responding to them even when they had adequate language and social skills. Moreover, it was possible that the child's speech intelligibility might have affected the social dynamic such that poorer speech intelligibility could result in more communication breakdowns and failures.

Most (2002) compared repair strategies used by children with and without hearing loss who had good and poor speech intelligibility. A total of 26 children age 11 to 18 were recruited. Sixteen children had bilateral, prelingual, severe to profound sensorineural hearing loss with fitted hearing aids, and 10 children with normal hearing. Eight of the children with hearing loss had good speech intelligibility and 8 had poor speech intelligibility. The children were divided into three groups: children with hearing

loss and good speech intelligibility, children with hearing loss and poor speech intelligibility, and children without hearing loss. Each and all of the children met with the examiner. The child was shown 5 pictures and was asked to describe what he or she saw, the examiner then elicited three neutral clarification requests: "huh?", "what?", and "I did not understand". All of the responses were recorded, coded and classified into categories of communication repairs (see Table 5).

Table 5: Most (2002), Communication repair categories

Category	**Definition**
Repetition	Repeats original sentence
Revision	Retains meaning of utterance but alters its grammatical form or uses other words.
Addition	Adds specific information to utterance.
Expansion to two sentences	Expands sentence into two sentences.
Cue	Provides additional background information, more cues to help focus on the sentence topic.
Simplification	Simplifies sentence by shortening, using fewer or more commonplace words or both.
Key word	Provides one important context word from utterance.
Explanation	Explains specific terms in original utterance.
Inappropriate	Provides unrelated utterances, fails to respond, or attempts to discontinue the sequence.

Results showed that the children with hearing loss and poor speech intelligibility used repetition significantly more than the other two groups while children with hearing loss and good speech intelligibility used significantly more inappropriate responses than the children with hearing loss and poor speech intelligibility (Most, 2002). Children without hearing loss used addition and cue significantly more than the other two groups, and used

expansion significantly more than the group of children with hearing loss and good speech intelligibility (Most, 2002).

Most (2002) hypothesized that children with hearing loss and poor speech intelligibility may be more accustomed to clarification requests. In contrast, children without hearing loss were not bothered by the requests because they felt confident in their speech. However, the group of children with hearing loss and good speech intelligibility made the most inappropriate responses compared to the other groups. Some of the children within this group were observed reacting angered and commented "enough already" after the requests indicating their awareness and sensitivity to their speech (Most, 2002). In comparison, this group of children may neither be accustomed to frequent clarification requests nor feel confident about their speech (Most, 2002).

The caveat in looking at the differences in types and frequencies of repair strategies limited the understanding of the quality and outcome of the interaction. Although differences were found in communication repair between children with and without hearing loss with different speech intelligibility, no research has examined the appropriateness of using a specific repair strategy in the context of a communication breakdown. In other words, there have not been studies that examined if a single repair strategy was most advantageous to use in the occurrence of a breakdown. In addition, none of the examined studies have incorporated emotional and psychological aspects of children with hearing loss' experience in understanding how their self and peer perceptions and attitudes might impact their social and language abilities.

Attitudes & Perceptions

Children with hearing loss were evaluated on their pragmatic abilities based on language skills, social skills and management of communication breakdown. However, no consideration was taken regarding their socio-emotional status. Martin et al. (201) found that children with and without hearing loss between the ages 5 and 9 reported experiencing the same levels of loneliness and peer acceptance while children ages 9 to 14 with hearing loss reported greater loneliness and lower perception of appropriate conduct. In other words, children with hearing loss experienced increased feelings of isolation and loneliness compared to their peers without hearing loss. The child's self perceptions may contribute and effect their social interactions. Moreover, the perceptions and attitudes that the communication partner hold may greatly impact the dynamic of the interaction.

Stinson et al. (1996) examined self-perceptions of social relationships in mainstreamed adolescents with and without hearing loss. A total of 220 students with hearing loss, age 16 to 19 or grade levels 10 through 12, were recruited from 15 public schools with programs allowing students with hearing loss to enroll in mainstream classrooms. All of the participants were given a social activity scale questionnaire containing 47 items that assessed participation for in-school and out-of-school activities, emotional security and perceived social competence. The social activity scale was administered to groups of 4 or fewer students at once. The students were asked before the test administration of how they want the items to be presented. The distributions of how

test was administered and presented were as follows: 1) all were read aloud or signed (36.5%), 2) about half (13.8%), 3) a few questions (29.2%), and 4) no help (25.4%). The students understood that this test was not related to their schoolwork and no grades would result from it. The students were also trained on the response scales (i.e. frequency, agreement).

Results showed that students who rated relatively high levels of school participation with students with hearing loss also rated relatively high levels of social activities (Stinson et al., 1996). Students who self-rated themselves to be more emotionally secure with students with hearing loss also reported relatively high levels of participation in school and in social activities with students with hearing loss. Lastly, high ratings of perceived social competence were associated with greater participation in school and in social activities with students without hearing loss and higher emotional security with peers without hearing loss. In addition, perceived social competences were associated with greater participation in social activities and higher emotional security with students with hearing loss (Stinson et al., 1996).

Moreover, results showed that ratings changed with mainstreaming: ratings of participation with peers with hearing loss decreased as the levels of mainstreaming increased (Stinson et al., 1996). In other words, students with hearing loss rated poorer participation with their peers with hearing loss when their peers had more experience in mainstreamed classes. The quality of participation or interaction shifted when students with hearing loss were given more opportunities and exposure with their peers without hearing loss and less with their peers with hearing loss. In addition, students who were

more frequently mainstreamed had better academic skills, inferring that these students often had better oral skills (Stinson et al., 1996). However, it could be that these students had strong academic performance and were therefore placed into mainstreamed classrooms. The relationship between academic performance and hearing status should be further investigated.

Although students who were more frequently mainstreamed reported fewer opportunities to interact with their peers with hearing loss, they continued to rate high emotional security; however, ratings of emotional security did not increase with more mainstreaming (Stinson et al., 1996). Students who were frequently mainstreamed and rated lower emotional security and lower perceived social competence with peers without hearing loss, suggested presence of negative social experiences. In other words, some students with hearing loss exceled academically but struggled socially in mainstreamed classrooms. The authors hypothesized that while these students felt more emotionally connected to their peers with hearing loss, they were subjected to poor social experiences with their peers without hearing loss due to fewer opportunities and interactions to peers with similar hearing status.

Placing students with hearing loss in inclusive classrooms may boost academic performance and increase oral abilities, but it could also hinder their social and emotional satisfaction (Stinson et al., 1996). The challenge is to find a classroom that facilitates social satisfaction, emotional security and academic excellence for children with hearing loss. Mere exposures and potential opportunities for children with hearing loss to interact

with children without hearing loss do not guarantee better relational bonds (Stinson et al., 1996).

Moreover, Brooks and Ellis (1982) examined effects of labeling in the self-esteem of adolescents with hearing loss. Investigation of the effects of labeling stemmed from the labeling theory, which stated that the effects of a deviant label could potentially exacerbate the problem (Globokar, 2008). In other words, the effects of a label with negative connotations could lead the individual to believe and live out the expression of the label. In this study, labels like "dumb" or "mute" often implied limited intelligence (Brooks & Ellis, 1982). While this study was done more than twenty years ago with perhaps outdated names (i.e. 'dumb' or 'mute'), the results from this study may still be relevant in today's classrooms.

A total of 51 students age 14 to 18 who were deaf or hard of hearing were recruited from a residential school for individuals with hearing loss. The authors differentiated children who were deaf from children who were hard of hearing. Children who were considered to be deaf had to be in a residential school, with or without a mechanical aid, and depended on visual cues for communication (Brooks & Ellis, 1982). Children who were considered to be hard of hearing had to be in a residential school, with or without a mechanical device, and can understand some speech but still used visual cues for communication (Brooks & Ellis, 1982). All of the students had about an average of sixth grade reading level and were given a self-esteem questionnaire. The questionnaire had 11 bipolar pairs of adjectives using a 5-point Likert-type scale. The student were to complete two evaluations, one asking to rate themselves from the

perspective of their mother, father, best friend and teacher "thinks I am", and one asking to rate themselves "as a person I think I am". Nine of 17 teachers were randomly selected and assigned to evaluate the students on the same 11 adjectives according to this statement: "as an adult how well do you think this student will function in the hearing world?" (Brooks & Ellis, 1982).

Results found that students who were hard of hearing reported more positive self-esteem than students who were deaf. The relationship was also found to be stronger in older children (Brooks & Ellis, 1982). The others' perception (mother, father, best friend and teacher) of the students was combined into one overall measure. Results revealed that students who were hard of hearing were reported to have more positive evaluations than students who were deaf. However, the teacher's evaluation indicated comparable results suggesting that teachers may view both groups of students with hearing loss to be similar. It was also found that the students' perceptions of the teacher's evaluation to be the most important predictor of the students' self-esteem rather than the label variable (Brooks & Ellis, 1982). In other words, the label of being deaf or hard of hearing did not affect the individual's self-esteem but the others' perceptions of them did. In addition, there were factors that contributed to reports of poorer self-esteem, like age, sex, race and parental hearing status, which have been found to be effect self-esteem but were not examined in this study (Brooks & Ellis, 1982). An additional caveat was the authors' working definition of "hearing impairment". The term hearing impairment did not take into account the continuum and various degrees of hearing loss, the implications of hearing

impairment in interpersonal interactions and the social setting of the interaction (Brooks & Ellis, 1982).

Dengerink & Porter (1984) also examined children's attitudes and perceptions towards peers with visible hearing aids. They recruited 100 5th and 6th grade children without hearing loss between the ages of 10 and 12 who had no exposure to peers with hearing loss in their classroom to rate 25 photographic slides of same-age peers. Five sets of 5 normal hearing boys age 10 to 12 were depicted in the following five conditions: 1) wearing a standard body type hearing aid, 2) wearing a post auricular type hearing aid, 3) wearing an in-the-ear type hearing aid, 4) wearing no aid, and 5) wearing glasses. The rating form included 15 adjectives attributes related to achievement and appearance (see Table 6).

Table 6: Dengerink & Porter (1984), 15 Semantic differential rating descriptors

Good looking	Plain
Productive	Nonproductive
Neat	Sloppy
Attractive	Unattractive
Outgoing	Shy
Beautiful	Ugly
Intelligent	Stupid
Educated	Uneducated
Successful	Unsuccessful
Leader	Follower
Friendly	Unfriendly
Loud	Quiet
Smart	Dumb
High achiever	Low achiever
Active	Passive

Results indicated that the children gave significant negative ratings to their peers wearing hearing aids. The mere presence of an aid suggested negative attitudes; children rated peers with hearing aids as less attractive on appearance factors. In-the-ear hearing aids were rated least negatively compared to body aid or behind-the-ear aid suggesting a correlation between appearance and size of aid (Dengerink & Porter, 1984). Moreover, children did not rate individuals with glasses negatively suggesting that glasses were more socially common and accepted than hearing aids. This study indicated that children without hearing loss might not be as aware and educated about individuals who wore hearing aids. Although this study was conducted 30 years ago, it warranted a re-examination of classroom dynamics in perception and social interaction between children with and without hearing loss.

Consequently, five years later, another study examined how adolescents viewed their peers who wore visible hearing aids. Silverman and Klees (1989) recruited 40 high school junior and seniors to rate a photograph of a male peer based on 81 semantic differential attributes (see Table 7). Half of the participants rated a photograph of the male peer with visible hearing aids, the other half without hearing aid.

The authors found a difference of at least 2 standard deviations in 19 scales for peers who wore hearing aids and those without. The ratings showed the male peer wearing visible hearing aids to be older, had a poorer self-concept, spoke more slowly and softly, had less confident, more mature, afraid, insecure, cautious, handicapped, tense, introverted, frightened, frustrated, deaf, emotional, realistic, and depressed compared to the peer who did not wear a hearing aid. This study reinforced previous

studies (Dengerink & Porter, 1984; Haley & Hood, 1986), which suggested that hearing children perceived their peers with hearing aids more negatively than peers without (Silverman & Klees, 1989).

Table 7: Silverman & Klees (1989), 81 Semantic differential rating adjectives

Afraid	Not Afraid
Immature	Mature
Insecure	Secure
Speaks slowly	Speaks rapidly
Rash	Cautious
Soft	Loud
Old	Young
Handicapped	Not handicapped
Tense	Relaxed
Introvert	Extrovert
Insane	Sane
Frightened	Not frightened
Frustrating	Not frustrating
Deaf	Not deaf
Emotional	Unemotional
Idealistic	Realistic
Negative self-concept	Positive self-concept
Not confident	Confident
Depressed	Happy

More interestingly, given the age difference in the two studies, the perceptions were relatively similar. For example, if the children from Dengerink and Porter's (1982) study were to age 5 years, they would be the same age as the participants in Silverman and Klee's (1989) study, which supported that their original perceptions remained

irrespectively of time. In other words, misconceptions and biases towards peers with hearing aids may have been perpetuated and remained unchallenged over those years. It could be that the perceptions and views that the students held as a child did not change; these children may not have had the opportunity to learn more about their peers with hearing aids. This finding revealed that preventative measures needed to be coupled with compensatory strategies in ameliorating negative perceptions of children with hearing loss.

Although Dengerink & Porter (1984) and Silverman and Klees' (1989) results were consistent, Haley and Blood (1986) incorporated and examined other factors that might affect perceptions of individuals with hearing loss. Haley and Blood (1986) examined whether setting and speech quality affected how children without hearing loss perceived children with and without visible hearing aid (body aid vs. post auricular aid). A total of 117 participants were recruited and divided into two groups. One group comprised of 87 students without hearing loss with average intelligence, age 12 to 15, from inner city schools (29), suburban schools (29), and rural schools (29). The second group consisted of 30 students age 12 to 15 enrolled in a school for hard of hearing students with average intelligence and moderate to profound hearing loss. More than 70% of the participants reported they had been exposed to individuals who wore hearing aids, and more than 85% reported exposure to individuals with speech problems. The participants rated two 13-year old male subjects, one with bilateral moderately severe high frequency sensorineural hearing loss and one without hearing loss on 15 semantic differential phrases covering 5 concept areas: socioeconomic status, speech, intelligence,

ambition and appearance. Both subjects were videotaped reciting the "Pledge of Allegiance" under 3 conditions: 1) wearing a body type hearing aid, 2) wearing a post auricular type hearing aid, and 3) wearing no aid at all. The two subjects were closely matched on appearance.

Results showed that participants from the school for hard of hearing to be the least critical of speech characteristics of the subject while participants from inner city schools were most critical. In addition, participants from the school for the hard of hearing rated the subjects significantly more negative on intelligence and had less desire to be around the subject. Participants from inner city schools gave more negative ratings than the other schools on how easily the subjects were understood. Results also found that the participant's quality of speech had a greater effect than presence of aid on the participant's perception and rating (Haley & Hood, 1986). Factors like setting, presence of aid, and speech intelligibility were found to have contributed to perceptual disadvantage for children with hearing loss.

A different study by Blood and Blood (1999) investigated how self-disclosure or self-acknowledgement of hearing loss might affect the observer's perception. Self-disclosure would help the communication partner to engage in conversations about hearing loss rather than to avoid the apparent difference and allow presumptions to be made (Blood & Blood, 1999). Eighty undergraduate students age 18 to 21 were recruited to watch and rate a short videotape of two Caucasian male speakers, age 19 and 22 respectively, with bilateral sensorineural hearing loss. The students rated the subjects from the videos under two conditions, one subject who verbally disclosed their hearing

loss and one subject who did not. Both subjects wore visible behind-the-ear hearing aids in the videos.

Prior to the study, the students were told a cover story that they were to work on a project with individuals with hearing loss. The students were randomly assigned into two groups. The first group saw the video of subject 1 disclosing his hearing status then video of subject 2 who did not. The second group saw the opposite videos of subject 2, then subject 1. All students rated the subject using a 14 bipolar adjective scale on their preference in interacting with the subject, and perceptions of the subject's personality, employability, intelligence and adjustments related to hearing loss (see Table 8). In addition, they were to answer the following two questions before watching the second video: 1) explain how you think the speaker would interact with strangers? and 2) how do you feel this speaker would act around you? After the first video was shown and the participants completed the adjective scale and two questions, the second video was shown a week later and the participants had to complete the adjective scale and new additional questions: 3) which speak would you prefer to work with, the first one or the second one? 4) and why did you select that speaker?

Results from question one indicated that the participant's perception of how well the subjects would interact with strangers was significantly more positive for the subject who expressed acknowledgement of his hearing loss. Question two asked how participants thought the subjects would act around them. Results found that majority of the participants gave neutral responses. Question three asked which subject the participants preferred to work with to which 75% of the participants reported preference

in working with the subject who disclosed his hearing loss. Question four analyzed the rationale in selecting the subject. Of the 75% participants who selected the subject who disclosed his hearing loss, they indicated positive reasons in their selection, and the remaining 25% who selected the subject who did not disclose their hearing loss they either had negative feelings about the subject or indicated indifference in their selection. Moreover, significant differences were found in 8 out of the 14 bipolar adjective scale between the two subjects. In other words, majority of the university students preferred the subject who self-disclosed and found them to be more sincere, likeable, decisive, reliable, sociable, friendly, employable and emotionally adjusted compared to the subject who did not (Blood & Blood, 1999).

Table 8: Blood & Blood (1999), 14 Bipolar adjective scales

Sincere	Insincere
Likeable	Not likeable
Trustworthy	Untrustworthy
Decisive	Indecisive
Physically normal	Physically abnormal
Reliable	Unreliable
Good sense of humor	Poor sense of humor
Mentally stable	Mentally unstable
Sociable	Unsociable
Friendly	Hostile
Strong character	Weak character
Intelligent	Unintelligent
Employable	Unemployable
Emotionally adjusted	Emotionally unadjusted

This study found an important difference from the perception of the observer in their desire to interact with their peers with hearing loss. Self-disclosure or self-acknowledgement of the individual's hearing loss resulted in significant difference in the perception of the individual's personality, employability, intelligence and adjustments. In addition to self-disclosure, other factors like subject's speech intelligibility, sex, visibility and type of hearing device, age, setting, and manner of disclosure may affect the observer's perception (Blood & Blood, 1999).

The caveat with measuring perception was the variability and individuality of both the observer and the observed. The observer's perception may be influenced by internal factors like personality and mood, or external factors like weather and setting. In addition, no studies examined whether the initial perception could be changed through exposure, interaction or education. This current study examined a hypothetical situation, which may not have reflected the reality of how individuals without hearing loss would perceive and interact with individuals with hearing loss. Future studies should measure the observer's perception in pre and post interaction with an individual with hearing loss to determine the strength and flexibility of the perceptions.

Moreover, a pertinent aspect of this phenomenon was missing: the perceptions of teachers. The teachers' attitudes and expectations played a role in how they perceived children with hearing loss and the quantity and quality of their interactions. Specifically, teachers' negative attitudes may lead to decreased academic performance and increased social isolation in children with hearing loss (Eriks-Brophy & Whittingham, 2013). Interestingly, teachers tended to be relatively unaware of their own attitudes and

expectations and the effects it has on students' behavior, self-concept and learning (Eriks-Brophy & Whittingham, 2013).

Thus, Eriks-Brophy & Whittingham (2013) examined teachers' attitudes, knowledge and teaching skills in inclusive classrooms with students with hearing loss. Questionnaires were distributed to 101 teachers who had taught student(s) with hearing loss in the last 5 academic years in two English-speaking school districts in Ontario, Canada. A total of 63 questionnaires were returned which included 15 male teachers, 46 female teachers age range from 26 to 60 with 1 to 33 years of teaching experience. The majority of the teachers (87%) had a bachelor of education degree while 8% had a master's level graduate degree. In addition, three fourths of the teachers taught at the elementary level (junior kindergarten – grade 8) while the remaining teachers taught at the high school level (grades 9-12). The teachers reported the distribution of their students' degree of hearing loss as follows: 5% with mild hearing, 13% with moderate hearing loss, 14% with moderate to severe hearing loss, 43% with profound hearing loss and 25% with unspecified degree of hearing loss. The majority of the students with hearing loss (78%) used spoken language as their primary mode of communication, 19% used Total Communication or American Sign Language and the remaining 3% were not reported. Twenty-two percent of students were cochlear implant users, 56% used hearing aids, 2% did not use amplification and no information was reported for the remaining 20% of the students.

The questionnaire examined 10 domains with 60 statements (six statements per domain) using a Likert scale that ranged from 1 (agree strongly) to 6 (disagree strongly).

Two of the 10 domains did not achieve satisfactory levels of reliability and were therefore eliminated from the analysis: roles of the itinerant teachers of the deaf and hard of hearing (ITDHH) and parents of children with hearing loss. The remaining 8 domains were analyzed: teachers attitudes toward inclusion of children with hearing loss, teacher confidence in teaching children with hearing loss, knowledge of hearing loss and strategies to facilitate teaching and learning, effect of inclusion on students with hearing loss, effect of inclusion on hearing students, effect of inclusion on teacher workload, teacher-ITDHH relationship and roles and responsibilities of teachers and support professionals (Eriks-Brophy & Whittingham, 2013).

Regardless of the grade level taught, years of teaching experience or number of students with hearing loss taught, results from domain 1 and 2 indicated favorable attitudes and strong support for inclusion of students with hearing loss in the classroom. Teachers generally felt confident working with students with hearing loss. It was found that the teachers responded the highest level of disagreement to the following statement "The topic of hearing impairment and its effects on speech, language, and academic development were sufficiently addressed in the curriculum of my teacher education program."

Domain 3 addressed the teacher's knowledge of hearing loss and strategies to facilitate teaching. Results indicated teachers felt they had obtained the necessary knowledge regarding hearing loss and its effects to develop strategies to facilitate effecting teaching for students with hearing loss. There was some variability in the

teachers' responses with few teachers indicating they did not feel like they had the required knowledge to teach this group of children.

Domain 4 examined the effects of inclusion on students with hearing loss. Results indicated teachers believed that inclusive classroom had positive effects on the students' self-advocacy skills, social development and self-esteem. The teachers perceived the students with hearing loss to be well accepted socially. In addition, domain 5 addressed the effects of inclusion on students without hearing loss to which the teachers reported inclusion of students with hearing loss did not disrupt classroom activities and routines nor had a negative impact on students' progress. However, teachers did indicate a perception that inclusion of children with hearing loss reduced the amount of instructional time available for the other students. There were greater variations within domain 5 compared to other domains but no trends were found at the teaching level, teaching experience or experience with students with hearing loss.

Domain 6 inquired the effect of inclusion on teacher workload. Teachers did not report students with hearing loss as requiring substantial amount of additional supervision or behavior management but they indicated as requiring more skill, patience, planning time, and curriculum modifications on the teacher's behalf.

Domain 7 inquired about the relationship between teachers and itinerant teachers of the deaf and hard of hearing (ITDHH). ITDHH were teachers who provided educational support for students with hearing loss who were in the general education classroom. Teachers reported feeling well supported by the ITDHHs and the work that they did with the students. High school teachers reported feeling less supported. In

addition, domain 8 examined attitudes regarding the roles and responsibilities of teachers and support professionals. Results revealed that teachers reported that speech and language development in children with hearing loss did not fall exclusively in the responsibilities of the ITDHHs or other professionals.

In summary, the teachers favored inclusion of children with hearing loss, felt confident in their ability to teach these children, perceived inclusion to be beneficial for children with hearing loss and did not have negative effects on children with normal hearing, did not feel an additional or substantial amount of workload, felt supported by ITDHH, and did not feel that other professionals have forsaken responsibility in working with this population of children (Eriks-Brophy & Whittingham, 2013).

This study had the following limitations: the small sample size of 63 respondents, skewed geographic representation, lacked of control group, randomized sample selection, standardized assessment, and information on the student's speech, language, social development and skills. In addition, it was critical that the teachers' perceptions may be limited to how children with hearing loss behaved under academic demands and may have neglected the impact of speech, language, and social deficits across speakers and situations. For example, the teachers may have limited access or observations of interactions for students with hearing loss during lunch or recess where social exchanges dominated the experience. Therefore, generalizability of this study was restricted. Further examination is warranted to examine how the teachers' perceptions of children with hearing loss' social abilities affect them inside and outside the classroom.

Intervention Approaches

Inclusion of children with hearing loss in mainstreamed classrooms provides ample opportunities for social interactions and capability to foster educated and well-rounded individuals. However, differences in social and communicative abilities in children with hearing loss may hinder or limit equal opportunity to succeed both socially and academically. In fact, children with hearing loss need additional support to enhance their communicative and pragmatic abilities to a comparative developmental level to their peers. Intervention approaches would incorporate all individuals immediate to the child's communication and social surroundings. In particular, the role of teachers, educators and family members are imperative to understanding and remediating challenges for children with hearing loss.

Luckner et al. (2012) examined challenges that children with hearing loss might experience in school and remediation strategies. First, Luckner et al. (2012) identified five challenges that children with hearing loss experience: 1) language, vocabulary and literacy delays, 2) gaps in background and domain knowledge, 3) inadequate knowledge and use of learning strategies, 4) social skills deficits, and 5) reliance on assistive technology. Language, vocabulary and literacy delays impact classroom learning as oral and written language skills are prime modes in demonstrating acquisition of knowledge (Luckner et al, 2012). More critically, children with hearing loss may not enter the classroom with the same speech and language level as their peers without hearing loss. Difference in their speech, language, vocabulary and literacy skills will affect their

academic development. As a result, children with hearing loss may have a difficult time understanding, navigating and completing demands and tasks placed upon them in the classrooms.

While Luckner et al.'s (2012) study targeted teaching and educating teachers how to remediate challenges in working with students with hearing loss, speech language pathologists need be aware of the strategies that teachers are implementing to assist generalization. Although the strategies were suggested for teachers, the strategies are general enough to support teaching and facilitate learning in students. The authors proposed 7 different strategies to strengthen language, vocabulary and literacy challenges emphasizing pre-teaching, enjoyment, engagement, linking, modeling, purpose and direct instructions.

Prior to teaching any lesson, first review the materials highlighting key terms and concepts and describing how the terms and concepts are used within the lesson. That is called *pre-teaching*. Enjoyment emphasizes on identifying the student's areas of interest then collecting diverse materials to implement lesson plans. *Engagement* is inviting and including the student to conduct a conversation that focuses on the materials. Moreover, *linking* is connecting what the students had read about the materials into their own experiences. *Modeling* is the act of "thinking out loud" in connecting pictures, key words and information and checking if the inferences are correct. *Purpose* is having students identify and infer text-based meanings to their personal lives and collect problems that rise and brainstorm possible solutions. Lastly, *direct instruction* is providing instructions concerning sight words, root words, prefixes, suffixes, morphemes, phonics, and

narrative and expository reading strategies. These strategies seemed intuitive and comprehensive such that teachers may already be using them in their classrooms regardless of the individual child's learning style.

For students who lack background and domain knowledge, the goal is determine the child's preferred learning style and implement a strategy that fits. Having background knowledge makes it easier to retain and recall newer information than if you have little or no association (Ormrod, 2006 as cited in Luckner et al., 2013). One of the strategies is the Know-Want-Learn (KWL) strategy (Ogle, 1986)). To begin, teachers can ask students to write down everything they know about the topic of study (Know), then discuss with students about what they wish to learn about the topic (Want), and lastly, at the end of the topic students can share what they've learned about the topic of study (Learn). Altogether that formulates the Know-Want-Learn strategy.

Providing a range of extra support will facilitate students' learning experience, especially for students who have limited knowledge, exposure and compensatory learning strategies. Examples of strategies that people use to enhance their learning are prediction, rehearsal (e.g. verbal, repeated reading, selective underlining), self-questioning, elaboration (e.g. mental imagery, creating analogies), organizing (e.g. outlining, graphic organizers), and summarizing (Muth & Alvermann, 1999 as cited in Luckner et al., 2012). Several strategies were proposed to target and increase usage of learning strategies. One strategy breaks down the course of the instruction into pre-instruction, onset of instruction, during instruction and conclusion of instruction with specific details of how to facilitate topic of study (Luckner et al., 2012).

Pre instruction includes establishing turn taking routines, topic establishments, engaging students and increasing their expectations to learn. At the onset of the instructions, the teacher will introduce new vocabularies, use graphic organizers and identify specific questions for the course. During the instruction, the teacher will think aloud, ask open-ended questions, and allow enough time for students to derive their answers. In concluding the instruction, the teacher will help the students to problem-solve, summarize and relate the content to real world situations. This set of strategies is more appropriate for classroom learning than independent learning.

Other strategies that promote independent learning include Read, Ask, Put or RAP (Schumaker & Deshler, 1984 as cited in Luckner et al., 2012), Read, Cover, Retell, Check or RCRC (Richards, 2008), and Preview, Ask, Read or PARS (Cheek & Cheek, 1983). RAP is recommended to teach students how to identify and paraphrase the main idea and details. The procedures are to read a paragraph, ask what the main ideas and ideas are then put the main ideas and details in your own words. Another strategy is the RCRC, which suggests students to first read a small part of the material, cover the material, and retell the material then check to see if the material was remembered correctly. Lastly, a strategy recommended for textbook materials is PARS. PARS stands for previewing the material by scanning the introduction, headings, graphics, summaries, asking questions related to the main ideas, reading the chapter to answer the questions, and summarizing the main ideas of the chapter. Depending on the students' strength and weaknesses as independent learners, various strategies could be taught to assist and promote critical self-learning abilities. In short, all of the strategies recommend teachers

to provide guidance and facilitation until the student becomes familiar and competent in independent learning.

Aside from academic support, students with hearing loss are often at risk for limited social relationships (Luckner et al., 2012). Strategies suggested for teaching social skills deficits included teaching students with hearing loss interaction skills, teaching hearing students sign language and about hearing loss, and designing classroom settings to promote communication and interaction with classmates (Antia & Kreimeyer, 2003 as cited in Luckner et al., 2012). Review of social skills strategies were the least detailed compared to other proposed challenges, lacking in specificity of how teachers could or should facilitate social skills among students. On the contrary, teachers aren't necessarily trained to teach social skills; rather they were trained to teach academic skills. The gap in Luckner et al.'s (2012) literature supports the need for speech language pathologists to inform and educate teachers how to promote social skill interactions for students with hearing loss.

The last proposed challenge among students with hearing loss is reliance on assistive technology. Many students have various types and kinds of assistive devices and that require teachers to be knowledgeable of the use and maintenance of the devices. In addition, students should be taught how to be responsible users of their devices, knowing how to properly use and care for their devices. Other strategies that facilitate greater social communication include facing the students when speaking, reducing background noise, providing sufficient wait time, providing adequate lighting, and using visual

schedules to facilitate classroom routines and expectations (Luckner et al., 2012). See Table 9 for the summary of proposed challenges and strategies.

Table 9: Luckner et al., (2012), Intervention approaches to help students who are deaf or hard of hearing succeed

Proposed Challenges	Proposed intervention approaches:
Language, Vocabulary, and Literacy Delays	Pre-teaching Enjoyment Engagement Linking Modeling Purpose Direct instructions
Gaps in background and domain knowledge	Know-Want-Learn (KWL) strategy
Inadequate knowledge and use of learning strategies	• Prior to instruction: Turn taking, topic establishment, engagement, and expectations. • At the onset of instruction: Vocabulary identification, graphic organizers, and adjunct questions. • During instruction: Dialogic interactions, thinking aloud, and wait time. • Conclusion of instruction: Problem solving, summarizing, and linking learning with living. • RAP (Read a paragraph, Ask yourself, Put the main idea in your own words) • RCRC (Read a small part, Cover the material, Retell, Check to see if it's correct) • PARS (Preview, Ask questions, Read to answer questions, Summarize)
Social Skills Deficits	Teaching students with hearing loss interaction skills Teaching hearing students sign language Teaching hearing students about hearing loss Designing classroom environments that promote communication and interaction among peers
Reliance on Assistive Technology	Knowledge of use and maintenance of device

In contrast to Luckner et al. (2012) , Ademokoya & Olujide (2006) identified general and specific types of social issues related to children with hearing loss with strategies to remediate. Ezewu (1987) highlighted common problems that all students exhibited in schools including the context(s) and individuals involved in propelling the issue. In addition, it is important to first understand what typical issues are for all students then to distinguish behaviors that are more prominent for students with hearing loss. For example common issues like absences from school, tardiness to school, sleeping in class to name a few. A comprehensive list is provided in Table 10.

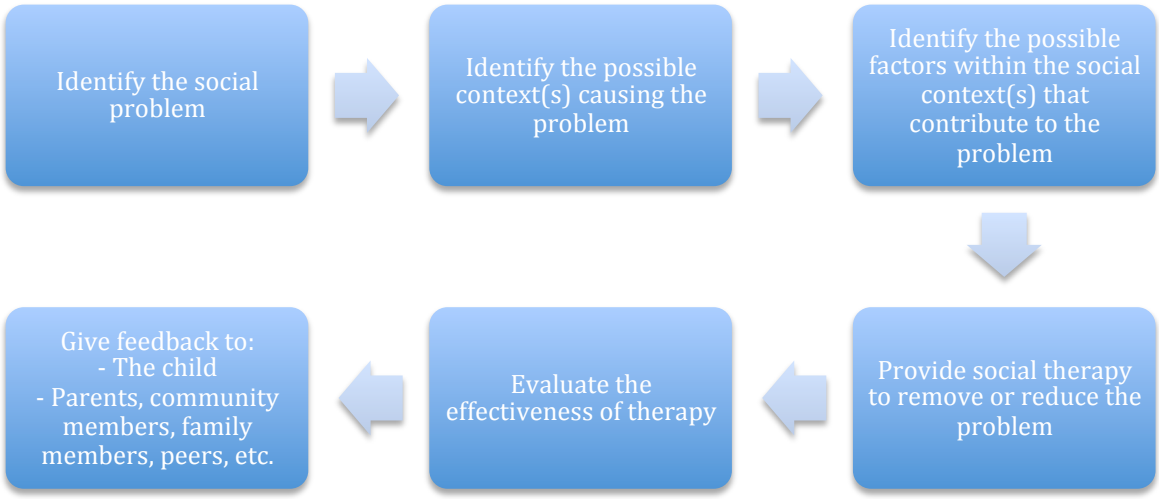
Table 10: Ezewu (1987), Common social problems among school children

Types of Social Problems	Social Context(s) Causing Them	Human/Material Factors involved
Absence from school	Home, the school and the community	Parents, teachers, school mates, peer-group and community values
Coming late to school	Home and the community	Parents, distance from school, means of going to and from the school
Leaving school before the closing time	Home, school peer group, community	Parents, teachers, peer group, the child's, community values, etc.
Dropping out of the school	Home, school peer group, community	Parents, teachers, community values, peer-group, family members, the child
Cheating in the class	The home, the school and peer group	Parents, teachers, peer-group and family members
Sleeping in class	The home and the school	Parents, teachers, kitchen staff
Inability to get along well with mates and teachers	The home, teachers, peer group, the school	Parent, teachers, peer group, classmates, etc.
Fighting in the class	The home, school, community, peer group	Parents, teachers, peer group, community values, community members
Stealing/extortion in the class	The home, the community and the peer group	Parents, community values, peer-group members, etc.

The strength of Ezewu's (1987) study was its inclusion of contexts and individuals that were associated with the cause of the common problems in school children. Providing context and individuals involved in a situation assist in understanding the larger picture and ways to remediate it. It is crucial to remember that all students come with different personalities and backgrounds such that exclusion of their culture, community or background will limit understanding of the underlying issues.

Ezewu's (1987) approach to remediating common problems among school children was to identify the occurrence of the social problem, diagnose the possible context(s) that cause the problem, and identify factors that give rise to the problem. Next provide therapy to reduce the problem. If the therapy is unsuccessful, evaluate the effectiveness relating to the child's behavior, and if the therapy is successful, give feedback to the child, parents, and professionals who come to contact with the child (see Figure 1). Treatment should never be limited to one person, one context or one opportunity; generalizations to different individuals, scenarios and situations further enhance the student's abilities to utilize skills learned, according to this approach. Therefore, effective and ineffective intervention approaches tried should be openly communicated to relevant individuals (i.e. educators, professionals, parents, caregivers) who frequently interact with the child.

Figure 1. Ezewu, (1987), Intervention procedure for managing social problems among school children



Moreover, Ezewu (1987) identified six common problems in children with hearing loss: hyperactivity, aggressiveness, indifference, mistrust, low self-concept, and low achievement motivation. Possible outcomes from these problems include but not limited to rejection, poor interactions, hostility, and ignorance (see Table 11).

Table 11: Ezewu (1987), Common problems in students with hearing loss

Types of Problems	Common social factors that reinforce the problems	Possible reactions/outcomes
Hyperactivity	Home	*a)* Unaccepting *b)* Ignorant of the nature of disability *c)* Ignorant of how to react to the detection or occurrence of hearing loss
Aggressiveness	School	*a)* Outright rejection *b)* Partial rejection characterized by exclusion from the mainstream of school activities *c)* Lowered expectations characterized by demeaned teaching efforts
Indifference	Community	*a*. Hostile to the child and his parents *b*. Ostracize the child *c*. Not willing to join in rehabilitating the child
Mistrust		
Low self-concept		
Low achievement motivation		

In contrast to the common problems seen in all children, common issues in children with hearing loss seem to be psychosocial in nature due to the difference in hearing status. Therefore, Ezewu (1987) proposed a framework to approaching social skills intervention for students with hearing loss. The framework is broken down into three parts, or orders. The first order call for gathering the following information about the student: type and onset of hearing loss, the student's home and community, the student's gender and personality, the student's medical history and background, and the student's learning style and habits. Next, specific social problems or behaviors are identified including the effects from the first order factors, relations or correlations to

second order. Lastly, third order suggests different therapies intervention that is most fitting to the problem (see Figure 2). Essentially, the framework is weaving understandings of the child's background to his or her behaviors and selecting an approach that incorporates the child, any relevant members to alleviate the concerns.

Figure 2: Ezewu (1987), Managing social problems for students with hearing loss

Perspectives from Luckner et al. (2013) and Ademokoya and Olujide's (2006) studies provided important insights in incorporating family and community into consideration as being integral to the 'unit of treatment'. Understanding that each child is a unique entity comprised of multiple and complex relationships with various members of his or her surroundings help to dissect the underlying difficulties to select the best remediating approach. However, there is still an absence of research available in providing social skills intervention to children with hearing loss.

Summary of findings

Children with Hearing Loss: Pragmatic Development

Children with hearing loss demonstrated differences in the use of pragmatic behaviors compared to children without hearing loss. Specifically, while children with hearing loss have a variety of pragmatic functions, they had more inappropriate usage than children without hearing loss and demonstrated lack of mastery compared to children without hearing loss (Most et al., 2010). In addition, children with hearing loss had greater peer entry success in a dyadic or one-to-one group than a triadic or entering a pre-established peer of two peers suggesting that children with hearing loss have an additional disadvantage of acoustic effect to social effect (Martin el al., 2010). Moreover, a sex effect was found such that girls had greater success than boys and that longer use of cochlear implants and high self-esteem were also associated with higher peer entry success (Martin et al., 2010).

Children With Hearing Loss: Communication Breakdowns

In regards to communication breakdown management, children with hearing loss were found to use more repetitions than children without hearing loss in one study (Toe & Paatsch, 2010). Ciocci and Baran, (1998) found that children with hearing loss used more revisions while children without hearing loss used more repetition, revisions and cues (see Table 4). More importantly, it was found that children without hearing loss initiated fewer interactions with children with hearing loss favoring interactions with other children without hearing loss (DeLuzio & Girolametto, 2011).

Communication Partner's Social Perceptions of Children with Hearing Loss

The effects of being perceived as less desirable for interaction is another important factor in examining and understanding how children with hearing loss manage communication and social differences. Brooks and Ellis (1982) found that the effects of a label did not impact the children with hearing loss' self-perception as much as what the observer's perceptions were. However, children without hearing loss rated children with hearing loss who wore hearing aids more negatively than children who wore glasses and children who wore no aid (Dengerink & Porter, 1984). In fact, the bigger the aid the more negative the ratings (Dengerink & Porter, 1984). In addition, adolescents were also found to rate children who wore visible hearing aids more negatively than those who wore no aids (Silverman & Klees, 1989). Depending on where the children resided, their perceptions of children with hearing loss varied as well. Specifically, children without hearing loss from urban areas rated children with hearing loss' speech characteristics and intelligibility most critically (Haley & Hood, 1986). In contrast to Silverman & Klees (1989) and Dengerink & Porter's (1984), Haley and Hood (1986) found children found speech to be more influential on perceptual ratings on children with hearing loss than presence of hearing aids. Moreover, Blood and Blood (1999) examined the effects of self disclosure of hearing status to peer perception and found that peers without hearing loss preferred to interact and gave higher ratings to students with hearing loss who disclosed their hearing status.

Lastly, teachers' perceptions of their students with hearing loss were also examined. Eriks-Brophy and Whittingham (2013) found that teachers favored inclusion

of students with hearing loss in mainstreamed classrooms. In general, teachers did not feel that they needed extra work to teach this population, however some teachers did feel that their educational training fell short in providing adequate support. Nonetheless, the teachers generally reported feeling supported by the surrounding staff and felt that inclusion of students with hearing loss was beneficial to all members in the classroom.

Conclusion

The outcome of this report found children with hearing loss to be less successful entering pre-established peer groups than children with hearing loss due to disadvantages of both acoustic and social effects. In addition, children with hearing loss were less approached and less preferred to be playmates by their peers with hearing. Moreover, children with hearing loss use different types and frequency repair strategies for communication breakdowns. In particular, children with hearing loss were delayed in their mastery or competency and consistency in the use of repair strategies compared to their peers with hearing. Lastly, perceptions and attitudes found in communication partners were related to mere presence of hearing aids in children with hearing loss such that the size and presence of a hearing loss were associated with negative perceptions. Intervention approaches need to gauge the various contributing factors that lead to poorer social interactions and unsuccessful communication attempts in children with hearing loss to support and enhance their pragmatic and communicative skills.

Discussion

The goal of this report was to understand how children with hearing loss manage communication and social differences. An additional aspect of management is the perception of communication partners. A third dimension involves teacher perceptions and teaching strategies for communication and social differences. The questions posed to evaluate available research relative to this goal were factors contributing to the diversity of this population, measurements of the observed behaviors, implications of findings, and gaps in current research. Findings relative to each of these questions would be addressed below. The importance of these findings drive the direction of therapy needed in school settings to level the development of social and communicative abilities in children with hearing loss.

Syndication of research results indicated that children with hearing loss exhibited different skills and abilities in their use of pragmatic functions as compared to their peers without hearing loss. Researchers have found differences in how children with and without hearing loss manage communication breakdowns (Ciocci & Baran, 1998; Most, 2002; Toe & Paatsch; 2010; DeLuzio & Girolametto, 2011), perceive self-competencies (Brooks & Ellis, 1982; Stinson et al., 1996), and employ social skills (Martin et al., 2010; Most et al., 2010). The common denominator for the differences were associated, but not limited to the children's hearing status. Major contributions of the present literature enhanced our understanding of hearing loss is manifested and expressed in children. However there were many limitations found within the available research base.

To begin, it was difficult to study the effects of hearing loss given how diverse and variable each individual's linguistic, cultural, educational and environmental background was. Secondly, different terminology has been used to describe individuals with hearing loss. Terms include individuals who are hearing impaired, hard of hearing, deaf or Deaf, hearing impediments. Authors' choice of terminology may have different implications regarding the individuals' type and degree of hearing loss and their abilities, which makes comparisons across studies even more difficult.

Most studies related to social competence of children and adolescents with hearing loss had non-random, limited, and small sample sizes, restricted geographic regions, absence of control groups, lack of longitudinal studies, diverse linguistic profiles, bounded or unnatural conditions or settings. There were few inclusions of home, community and school expectations and values, deficient inclusion of the culture in individuals with hearing loss. Study replications were rare which complicates application and generalization of available findings for this population. In others words, there isn't a one size fits all intervention approach.

As dynamic as the children we work with, our intervention strategies must be tailored to fit the familial, cultural, linguistic, functional and environmental expectations for the child. Families and speech language pathologists must read the studies with caution as they may or may not be application to their client or family member. Finding the underlying cause of social skills deficits is the first step towards selecting an appropriate strategy. In-depth investigation of the child's daily activities, and relationships will provide insights to both the cause and participants involved in changing

the child's behaviors toward age expectations for social interaction. Presence of hearing loss should not limit the child's quality of life. Awareness and appropriate intervention strategies form one first step towards advocating comprehensive learning environments and healthy social relationships for children with hearing loss.

Future research needs to include longitudinal study of development, use and mastery of pragmatic functions in children with hearing loss. Investigation of pre and post perceptions of children with hearing loss with direct interaction is highly recommended. Furthermore, understanding of how self-disclosure might dispel potential negative perceptions of individuals with hearing loss will be beneficial for intervention purposes.

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