Pragmatics and Social Communication: Children with Hearing Loss in Early Childhood Settings

Hillary Guest
Abstract

Research has shown that pragmatic understanding allows children to appropriately communicate and form peer relationships. Hearing loss (HL) in early childhood may lead to immature or delayed social communication due to an early lack of exposure, among other factors. The delay in social communication is thought to lead to limited use of common conversational strategies. Therefore, children with HL are at risk for below average use of initiations, responses, and conversational repairs. This study serves to examine the differences and similarities in social communication behavior between children with HL and children with typical hearing in early childhood settings. The six participants included in the study ranged in age from 2- to 6-years-old. Three participants had a history of HL. Three participants had typical hearing. The two groups of participants were matched based upon hearing age. Data were recorded through the LENA, an audio capturing device. The results of this study showed that children with HL fell behind their peers with typical hearing in use of conversational repair. This finding signifies the greater need for therapists to focus on conversational repair strategies within this group rather than simply prompting initiations and responses.

Keywords: social communication, hearing loss, conversational strategies, early childhood settings
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PRAGMATICS AND SOCIAL COMMUNICATION: CHILDREN WITH HEARING LOSS IN EARLY CHILDHOOD SETTINGS

By

HILLARY GUEST

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Dr. Carla Wood Jackson, PhD.
Thesis Director

Dr. Alice-Ann Darrow, PhD.
Outside Committee Member

Linda Walker, MCD.
Committee Member
Everyday interactions require the use of appropriate pragmatic communication behavior. *Pragmatics* refers to the rules of language required to allow coherent and appropriate social communication (Most, Shina-August, & Meilijson, 2010). Pragmatic communication behaviors involve the ability to introduce and maintain conversation, take turns, modify statements, and ask questions (Adams, 2002; Duncan & Perozzi, 1987; Ninio & Snow, 1996). Levinson (1983) defines pragmatics as a context-based aspect of language, unlike syntax or semantics. It is the piece of meaning that varies with time, place, and involves both speaker and listener (Most et al., 2010). Studying the use of pragmatic communication behaviors by children with hearing loss (HL) allows a basis for understanding the implications of therapy intervention. It also gives insight into further therapies that may be useful for this particular group.

*Social Communication and Importance of Peer Relationships*

Meaningful social relationships with peers have shown to benefit psychological well-being at all stages of an individual’s life (Ladd, 2005). Studies indicate that the ability to communicate effectively leads to more close relationships, and maintaining a better view of one’s self (Martin, Bat-Chava, Lalwani, & Waltzman, 2011; Stinson & Whitmire, 2000). Additionally, the ability to initiate and maintain successful peer relationships in the preschool years has shown to lead to more academic success in later school age (Buhs, Ladd, & Herald, 2006). Researchers have found that successful peer interactions during preschool years may be linked to better emotional management,
smoother academic transition, and effectively sustaining more meaningful peer relationships later in life (McElwain & Volling, 2005). According to prior research, for preschool-aged children, the formation of peer relationships is a central and fundamental part of growth and development (Buhs et al., 2006).

Hearing loss (HL), or deafness in early childhood and the preschool years can contribute to difficulty finding and maintaining these critical social relationships with hearing peers (Weisel, Most, & Efron, 2005). Due to social interaction difficulties children with HL may report limited popularity (Nunes, Pretzl, & Olsen, 2001) and more feelings of loneliness relative to those reported by peers with typical hearing (Kent, 2003; Martin et al., 2011; Most, 2007). These deficits regarding social acceptance may further impede pragmatic development of children with HL.

Language Development and Hearing Loss

Children with HL are often associated with a higher risk of social development delay, and may fall behind their peers with typical hearing in social communication. This may be due to the role hearing ability plays on overall language and vocabulary acquisition, among other factors. One study conducted by Yoshinaga-Itano (1994) concluded that young children with HL who are late-identified demonstrated delay in expressive vocabulary development relative to typical hearing peers. Expressive vocabulary delay greatly impacts pragmatic use of language and the earliest major milestones of pragmatic development (Yoshinaga-Itano). The combination of disrupted language development and subsequent delays in vocabulary growth lend to immature elements of conversational discourse for preschool-aged children (Yoshinaga-Itano,
Another study suggests language development often serves to predict how well children will behave socially (Martin et al., 2011).

Prior research indicates challenges in studying pragmatic and social communication development within early childhood settings of children with HL. There exists a multitude of differences between each individual child that must be taken into consideration when looking at social communication barriers particularly with children with HL. A number of significant variables influence language development within this population. Examples of factors that influence language outcomes include age of the child at identification of HL (e.g., Geers & Moog, 1989; Mayne, Yoshinaga-Itano, Sedey, & Carey, 1998; Moeller, 1998; Yoshinaga-Itano, Sedey, Coulter, & Mehl, 1998); age at which intervention initiated (Calderon & Naidu, 2000; Moeller, 2000); and the severity of HL (e.g., Davis, Shepard, Stelmachowicz, & Gorga, 1981; Musselman, Wilson, & Lindsay, 1988). Expressive language outcomes are also influenced by medical conditions that may co-exist in addition to the child’s HL (Mayne et al., 1998; Pipp-Siegel, Sedey, VanLeeuwen, & Yoshinaga-Itano, 2003; Yoshinaga-Itano et al., 1998). This is important to note, given the high percentage (30%) of children with hearing loss who have multiple diagnoses or disabilities (Pipp-Siegel et al., 2003; Wolff & Harkins, 1986). The presence of other diagnoses, such as autism is also sometimes associated with a higher rate of social problems among children with HL (Chess & Fernandez, 1980; Meadow, 1984; Pipp-Siegel et al., 2003) which may also influence social communication.

It is important to look at those factors that lead to a degradation of peer relationships within the context of early childhood settings. Most students with HL are currently educated within an inclusive setting (Hyde & Power, 2003; Watson, Gregory, &
Powers, 1999). As more children with hearing loss are mainstreamed, concerns of social communication and social integration may be prioritized more frequently as opportunities for social exchanges with peers occur throughout the day. Much of the daily classroom learning revolves around one-on-one or small group student work (Toe & Paatsch, 2010). Children with HL may be at a disadvantage in responding to social communication opportunities without support.

**Pragmatic Behaviors**

Effective communication requires speakers to share their thoughts, feelings, and ideas with conversational participants. A listener must pay close attention to details and remain sensitive to the speaker’s syntactic, semantic, and pragmatic cues. Communication breakdown is frequent in daily conversation, often causing a message to lose its intended meaning. These communication breakdowns give rise to repair strategies that seek to overcome these disruptions (Most, 2002). According to Most (2002), common repair strategies, such as repetition, are among the most frequently used for young children. Another common repair strategy is the use of clarification questions. Asking “Huh?” or “What?” is a way for young children to seek general information about a topic. Specific clarification questions regarding particular elements of an interaction are often later developing. Given the high likelihood of language delay associated with HL, children with HL may miss out on many opportunities to develop sophisticated communication repair strategies and other types of pragmatic behaviors required for effective communication. The first signs of conversational repair begin around age 40 months for those with normal hearing (Gard, Gilman, & Gorman, 1993; Haelsig & Madison, 1986; Hall, Burns, & Pawluski, 2003; Halliday, 1975; Jaswal & Markman,
The earliest repair strategies are broad and unrefined, unable to elicit specific preservation of conversation. The ability to repair conversation ensures effective communication takes place appropriately. Numerous works indicate the relationship between linguistic level and pragmatic ability (Bebko, Calderon, & Treder, 2003; Ciocci & Baran, 1998; Lederberg & Everhart, 2000; Nicholas, Geers, & Kozak, 1994).

Children’s mastery of repair strategies can be affected by fewer experiences with peers, difficulty processing conversations auditorily, and poor underlying language skills. Children with HL may demonstrate difficulty understanding repair strategies from their lack of exposure. Prior research assumes that children with HL receive less exposure than children with typical hearing to natural social interactions, leading to fewer chances to develop the pragmatic skills needed for similar interactions (Clarck, 1989; Gallaway & Woll, 1994). By missing out on crucial elements of pragmatic development, children with HL become vulnerable to communication breakdown among hearing peers and teachers. Studies suggest that children with HL with hearing parents have a much more challenging time accessing auditory information and receive insufficient exposure to visual-based access to language, culminating in an overall inadequate early learning experience (Carney & Moeller, 1998; Spencer & Meadow-Orlans, 1996) and poorer language skills relative to their typical hearing peers (Calderon, Bargones, & Sidman, 1998; Griswold & Cummings, 1974; Mayne et al., 2000; Yoshinaga-Itano, 1994). Poor language skills may limit a child with HL by disrupting social development. Children
with HL may be unable to relate to others, share thoughts, initiate conversation, and form meaningful peer relationships.

High school graduates with HL often leave the school system with the linguistic abilities equivalent to that of a child aged 12. In a comparison study done by Toe and Paatsch (2010), hearing students were paired with peers with HL to model student-to-student communication in an inclusive, classroom setting. The purpose of the study was to find out how well children with HL could understand hearing peers, and vice versa. The study involved the use of a question-and-answer trivia game. Each student was given the opportunity to read the questions while the other answered. Before the student answered the question, they were instructed to repeat the question verbatim. The results showed that when asked to repeat questions prompted by hearing peers, the students with HL had a much more difficult time performing the task. The children with HL were able to correctly answer the majority of the trivia questions, despite the challenges associated with repeating questions asked. This finding suggests that in optimal linguistic environments with limited auditory distractions, students with HL are able to understand and comprehend their hearing peers. In addition, children with HL also demonstrated significantly more general clarification strategies than their hearing peers when they were unable to initially repeat questions. This may suggest that the children with HL exhibited a better-developed repertoire of general clarification tactics compared to hearing children.

Social Communication Differences

Recent research seems to indicate developmental differences between children with HL and children with typical hearing. Lederberg and Everhart’s (2000) study reported similar trends of overall pragmatic development between 22 and 36 months of
age, however, children with HL demonstrated specific difficulties in topic maintenance and needed more clarifying instructions. Children with HL also made fewer requests for information, and showed less concise communicative functions. The researchers attributed the differences to delay in language development of the children with HL.

Another study by Nicholas, Geers, and Kozak (1994) examined communication development of children with HL compared to typical hearing children. The children with HL were matched to two distinct categories of typical hearing children. First, they were matched by chronological age. Second, they were matched by stage of linguistic development. In the age-matched pairs, particular acts of pragmatic development such as requesting information, responding to a question, and protesting were all acquired in the normal hearing children by age 30 months. At age 40 months, the children with HL still had not developed the ability to ask and respond to questions. In the linguistically-matched pairs, the children with HL demonstrated a higher level of development regarding their use of specific pragmatic behavior.

Research has also looked at specific pragmatic behaviors of children with HL. The conversational element of turn taking has been shown to be more difficult for children with HL. It becomes even more difficult when the number of individuals partaking in the conversation increases (Duchan, 1988). Elements of conversation are often missed due to the increased effort that is placed on identifying the speaker, rather than simply listening (Brackett, 1983). Duchan (1988), however, cautioned that a child with HL is not necessarily lacking turn taking skills. The ability to engage in turn-taking is hindered only by the child’s difficulty in hearing the audible cues that take place within normal conversation.
Gaps remain in the literature involving our understanding of the exact social language differences between children with HL and peers with typical hearing. Exploring the differences could provide additional insight into what communication behaviors are still creating social deficits for children with HL within early education settings.

**Purpose of Study**

The purpose of this study was to examine and describe the social communication skills of children with HL within inclusive community settings. The primary goal of the study was to determine if children with HL demonstrate similar counts of social communication functions in an early childhood setting when compared to children with typical hearing. This study was undertaken to examine the communication differences between children with and without HL and explore the nature of those differences. It is hypothesized that even when matched along parameters of hearing age, children with HL remain developmentally behind in their rate and use of social communication skills when compared to typical hearing peers.

**Aims**

This study aimed to further current knowledge regarding social use of language for children with HL who were diagnosed during an early stage of language learning. This study was guided by the following questions:

1. What is the average rate of social communicative acts (as measured by initiations, responses, conversational repair, and ignoring of requests) for both children with HL, and children with typical hearing?

2. What is the average rate of social communicative acts for each group when speaking to adults?
3. What is the average rate of social communicative acts for each group when speaking to peers?

Methods

The purpose of this study was to examine the social communication skills of children with HL in a typical early learning environment. This study also looked at the variation of social communication behaviors for children with a history of HL in comparison to typical hearing peers. The participant group containing children with HL were compared to norms using hearing age, as opposed to their chronological ages. Hearing age was used in selecting the comparison group to allow for appropriate comparison through a consideration of the linguistic developmental lag that occurs when HL occurs during the first few years of life. Hearing age can be defined as the number of years since an individual received an initial form of amplification.

In this section of my study, I will give a detailed description of the methods used in designing and conducting my study. First, I will give a general overview of the participants. Second, I will include more in-depth demographic information for each participant group. Third, I will describe the assessment instrument and process of administration I used to generate my study. Finally, I will include a description of the forms of data analysis employed.

Participants

Six children participated in this study, ranging in age from 24 to 83 months. Participants were segregated into two groups based upon hearing status. The first group included three children with a mild to profound degree of HL. Within this group, two participants wore cochlear implants and one did not wear a sensory device but had a mild
hearing loss. The second group included three children with typical hearing. Some of the participants with HL had undiagnosed attention or behavioral problems, and/or underdeveloped language skills. These factors were not controlled out of the study due to the high co-occurrence for children with HL in the overall population (Pipp-Siegel et al., 2003; Wolff & Harkins, 1986). These conditions are likely to influence expressive language outcomes and present more generalizable productions of speech (Mayne et al., 1998; Pipp-Siegel et al., 2003). Of the children with HL and additional difficulties, special ongoing supports are regularly administered through their childcare setting or through university clinic services. All participants came from a variety of early learning environments in the community. All participants were found through a university Speech and Hearing Clinic. Participants were not excluded based on gender, race, ethnicity, or socioeconomic status.

*Children with Hearing Loss*

The three participants in the HL group were between 53 and 83 months of age at the time of the study. Of this group, two participants received cochlear implants prior to the study. The third participant did not use a sensory device, but had a positive history of conductive HL. Degrees of HL ranged from mild to profound for all participants. Hearing ages for the group, or time since the participants were first fitted with hearing amplification, were between 31 and 36 months, with a group mean hearing age of 34.33 months ($SD= 2.9$ months). All of the children were in oral environments that promoted the use of spoken English. One child was bilingual and had Spanish-speaking family members but was English dominant. At the time of the study, two children had no additional diagnosed impairments aside from HL. One child exhibited signs of childhood
apraxia, but had not received a formal diagnosis. There was no evidence of hereditary
cause of HL for any of the children.

*Children with Typical Hearing*

Each participant included in the comparison group had no diagnosed hearing
impairment and typical hearing. The three participants were between 24 and 36 months of
age at the time of the study, with a group mean age of 30.00 months \((SD= 6.0 \text{ months})\).

Children were monolingual English-speakers and had no additional medical diagnoses or
disabilities.

*Assessment Instrument and Administration*

*Language Sampling.* This study involved the use of a digital recorder to obtain
each language sample. Language samples were taken using the Language Environment
Analysis (LENA) digital language processor. The electronic device was worn throughout
the length of the school day in a specially designed t-shirt that had a fitted front pocket
for the LENA recording device to insert into. For the purposes of this study, one full day
of speech was sampled.

Prior to this study, LENA samples were gathered on a large sample size of normal
hearing children. A random selection of three children from the same hearing age range
was made to establish normative data for the duration of this study. These samples were
chosen after participants with hearing loss were selected to ensure both would be of
similar hearing age.

After all samples were taken, specialized software, called ADEX, associated with
the LENA device was used for linguistic data analysis. The software allowed the user to
view graphs corresponding to the child’s speech output. Counts of vocalizations and
conversational turns were automatically calculated. To determine the child’s use of other communicative functions, standard headphones were used. The speech sample was played and replayed in segments to determine specific pragmatic use. The conversational elements were calculated to find corresponding percentages.

Additionally, a language sample was transcribed consisting of 30 minutes or a minimum of 50 consecutive utterances. This transcription served as means to obtain a general picture of the child’s mean length of utterance (MLU), however, this was not a primary focus of this research project. The remaining length of the sample was utilized to answer the research questions that were posed. That is, the sample was analyzed to count the number of initiations, responses, repair functions, and ignores. These counts were compared objectively through the use of percentages, which were then used to compare and contrast against the typical hearing group.

The utterances were coded for their pragmatic social communication behavior using the Social Interaction Coding Scale (SICS). This scale serves as a tool that is designed to describe a preschool child’s use of expressive and responsive language throughout their day (Rice, Sell, & Hadley, 1990). The goal of SICS is to accurately index verbal initiation versus conversational responses in natural environments with minimal interference from teachers or practitioners. SICS allows for reliable, useful assessment that may give practitioners a practical baseline for developing treatment plans and monitoring pragmatic performance and progress. The SICS profile takes into account each variable of language production such as the setting, conversational partner, and stage of linguistic development.
The coding process involved interpretation of the context or pragmatic opportunity during the sample and the child’s response. The observer’s role was to focus on these factors to provide a complete analysis for further investigation. After a sample was received, the observer was required to identify as well as note the child’s use of conversational turns, length of utterance, and ability to initiate and respond. To calculate the child’s pragmatic functions, an observation log detailed the circumstance of each utterance. Each observation block was broken down into 5-minute samples and indexed by time, conversational partner, activity, and interactive status. This process was used as a measure to describe the child’s continuous speech throughout the school day. A chart contained the full-length of descriptions pertaining to each hard of hearing child. The following codes were used to analyze interactive status:

1. **Initiation (I)**- an attempt to begin conversation with either a conversational partner or a general start of interaction.

2. **Response (R)**- a verbal response to any conversational partner’s initiation.

3. **Ignore (IG)**- the participant fails to answer or communicate with a conversational partner.

4. **Conversational Repair (CR)**- any use of interactional strategy to mend conversational breakdown.

Parents were verbally informed about the details of the LENA device and the general purpose of the study. A participant consent form also served to inform those involved. Parents of participants were given the option to receive the completed results of their child’s language sample after the research concluded.
Data Analysis. The analysis consisted of two components: Descriptive analysis and comparative analysis.

Descriptive analysis. In this section of the research, the children with HL were the principle subjects of interest. Data obtained through the use of digital voice recording and coding was translated to graphs to show how each child with HL used social skills. This quantified the social functions of children with HL and predicted the usefulness of daily interactions in an educational setting. This is separate from the comparison between HL and typical hearing pragmatic behavior.

Comparative analysis. The children with HL served as the primary group of interest, and the existing data for hearing age matched hearing peers served as a comparison group. This comparison directed the research towards making judgments in regards to the differences between the two groups in their use of social communication. Each interactional element describes similarities and differences of overall pragmatic function.

Results

Once all of the samples were collected, the analyses were conducted. The study sought to examine the differences in social communication behavior between children with HL, and children with typical hearing. This study furthered previous findings on the observed behaviors of children with HL in early education settings.

After transcribing each sample, each of the four interactive behaviors were counted for frequency of occurrence to align with the principles of the SICS scale. Interactive behavior counts were done for both adult and peer interactions. The first
section discusses the results of language behavior data between child and adult, followed by child and peer.

*Children and Adult Interactions*

*Children with Hearing Loss: Interactions with Adults.* The total number of group initiations ranged from a minimum of 20 to a maximum of 36 occurrences. The group’s mean for initiations between child and adult was 30.00 ($SD = 8.7$). The total number of group responses ranged from a minimum of 42 to a maximum of 52 occurrences. The group’s mean for responses between child and adult was 49.67 ($SD = 5.5$). The total number of group conversational repairs ranged from a minimum of 0 to a maximum of 2 occurrences. The group’s mean for conversational repair between child and adult was 1.00 ($SD = 1.0$). The total number of group ignores ranged from a minimum of 0 to a maximum of 4 occurrences. The group’s mean for ignores between child and adult was 2.00 ($SD = 2.0$).

*Children with Typical Hearing: Interactions with Adults.* The total number of group initiations ranged from a minimum of 7 to a maximum of 39 occurrences. The group’s mean for initiations between child and adult was 26.67 ($SD = 17.2$). The total number of group responses ranged from a minimum of 2 to a maximum of 45 occurrences. The group’s mean for responses between child and adult was 22.67 ($SD = 21.5$). The total number of group conversational repairs ranged from a minimum of 0 to a maximum of 20 occurrences. The group’s mean for conversational repair between child and adult was 8.33 ($SD = 10.4$). The total number of group ignores ranged from a minimum of 0 to a maximum of 2 occurrences. The group’s mean for ignores between
child and adult was 0.67 ($SD= 1.2$). Table one depicts individual rates of communicative acts for both participant groups.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Rates of Communicative Acts with Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Children with Hearing Loss</td>
</tr>
<tr>
<td>Function</td>
<td>P1</td>
</tr>
<tr>
<td>Total Utterances</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>93</td>
</tr>
<tr>
<td>Initiation</td>
<td>36</td>
</tr>
<tr>
<td>Response</td>
<td>52</td>
</tr>
<tr>
<td>Conversational Repair</td>
<td>0</td>
</tr>
<tr>
<td>Ignore</td>
<td>4</td>
</tr>
</tbody>
</table>

*Note. *$N$ (Number of utterances) reflects number of utterances with discernable intent

**Peer Interactions**

*Children with Hearing Loss: Interactions with Peers.* The total number of group initiations ranged from a minimum of 0 to a maximum of 6 occurrences. The group’s mean for initiations between child and peer was 3.00 ($SD= 3.0$). The total number of group responses ranged from a minimum of 1 to a maximum of 7 occurrences. The group’s mean for responses between child and peer was 4.00 ($SD= 3.0$). No acts of communication repair were observed during sampling. The total number of group ignores ranged from a minimum of 0 to a maximum of 1 occurrence. The group’s mean for ignores between child and peer was 0.33 ($SD= 0.6$). Table two below outlines the rates of communicative acts for each participant with HL.

*Children with Typical Hearing: Interactions with Peers.* Peer interaction data could not be obtained from the selected samples for children with typical hearing.
Table 2  
Rates of Communicative Acts with Peers  
Children with Hearing Loss

<table>
<thead>
<tr>
<th>Function</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Utterances</td>
<td>93</td>
<td>91</td>
<td>80</td>
</tr>
<tr>
<td>Initiation</td>
<td>0</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Response</td>
<td>1</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Conversational Repair</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ignore</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Note. *N (Number of utterances) reflects number of utterances with discernable intent

Overall Communicative Functions

Table 3 presents data corresponding to percentages of communication functions for the total sample. Participants across both groups saw similar rates of initiations for obtained samples. The highest rate of responses (63%) occurred within the group containing children with HL. In contrast, the lowest rate of responses (16%) occurred within the group containing children with typical hearing. The highest rate (20%) for conversational repair was seen in children with typical hearing. Both groups had similarly low counts of ignores across samples.

Table 3  
Percent of Daily Social Communication

<table>
<thead>
<tr>
<th>Function</th>
<th>Children with Hearing Loss</th>
<th>Children with Typical Hearing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P1</td>
<td>Percent</td>
</tr>
<tr>
<td>Total Utterances</td>
<td>93</td>
<td>39%</td>
</tr>
<tr>
<td>Initiation</td>
<td>36</td>
<td>39%</td>
</tr>
<tr>
<td>Response</td>
<td>53</td>
<td>57%</td>
</tr>
<tr>
<td>Conversational Repair</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Ignore</td>
<td>5</td>
<td>5%</td>
</tr>
</tbody>
</table>

Note. *N (Number of utterances) reflects number of utterances with discernable intent.
Discussion

The present study was designed to compare the components of functional pragmatic communication among children with HL and those children with typical hearing.

Key Findings

One of the key findings was in relation to the frequency of conversational repair for children with HL. The results of the present study showed that children with HL use fewer counts of conversational repair when engaged in interactions with both adults and peers. In this study, as in Nicholas & Geers (2003), children with HL struggled to use conversational repair strategies and seemingly failed to understand the importance of preventing communication breakdown. The precise reasoning for this finding has yet to be determined. This contradicts the findings of Toe and Paattsch (2010), where children with HL were found to demonstrate more refined clarification strategies than children with typical hearing. The different findings from this study might be due to the way that pragmatic functions were tested. In Toe and Paattsch’s study, pairs of children were observed in a quiet room during a structured task. This controlled communication environment might have contributed to more favorable conversation and a higher likelihood of children with HL using clarification strategies.

An unexpected finding of the present study was the comparable rates of initiations used by children in both groups. Children with HL seemingly had no difficulty initiating conversation with those around them. However, those with HL relied more heavily on prompting through toys or activities to generate novel utterances. Adults in the environment often structured conversation, which might have also altered the typical
forms of interactions. Although both groups were proficient in initiating, the children with HL had a greater number of unintelligible initiations. This resulted in ineffective turn taking leading to many instances of conversational breakdown. This finding is consistent with previous studies that have examined turn taking behaviors of children with HL. These studies have shown that turn taking becomes increasingly more difficult as the number of communication partners increases. Crucial elements of conversation are missed due to failing to capture audible cues (Duchan, 1988).

The results of the present study demonstrated that children with HL exhibit more counts of response behavior than their typical hearing counterparts. This is an interesting finding because the previous study by Nicholas et al. (1994) suggested that children with HL have not yet developed the ability to respond by age 40 months. The mean hearing age for the children with HL was found to be 34 months. Despite this low age, all three participants had an overall response rate of 51% or higher. Children in the typical hearing group did not correspond with data that stated developed response behavior should be established by 30 months of age (Nicholas et al., 1994; Nicholas, 2000).

Limitations

There are a number of limitations that were found in the present study that are important to consider when interpreting the findings. First, the environments in which samples were taken for each group varied. While children with HL were all sampled in the same summer camp environment, children with typical hearing were sampled from community settings. Samples were gathered in the most naturalistic way possible, since the LENA is unobtrusive in audio recording, but this did not fully rule-out differences in the interactive nature of the contexts. For example, children with HL were more often
placed in situations that encouraged the participant to verbalize. These children were
sampled during the university communication camp. Adults frequently would ask
questions that required spoken answers. This may have resulted in an inflated response
rate amongst the children with HL.

Another limitation of the present study was the variability of communication
partners. Graduate clinicians and clinical supervisors were most often the communication
partners for the samples taken from children with HL. Children with typical hearing were
sampled while interacting in other natural contexts that included parents and siblings. It
may have been beneficial to obtain samples from interactions that occurred at home, as
well as school, to determine the differences in communicative functions among familiar
and unfamiliar communication partners for both participant groups.

A final limitation of the study was the way in which utterances were coded. At
times, utterances could have been interpreted with multiple pragmatic functions. For
simplicity, most utterances were only given one function. Further, it was difficult to
ascertain communicative intent with only an audio sample. For this reason, the
combination of both audio and visual sampling would form a more appropriate sampling
method on a future study.
Recommendations For Future Research

The findings from this study showed that the children with HL were able to demonstrate relatively comparable rates of pragmatic functions when compared to peers with typical hearing, with the exception of communicative repairs. However, more studies should be done to improve generalization of these results to children who vary in their individual characteristics. Several changes could be made for future studies. First, researchers should look into social communication differences when children with HL are placed in less-structured environments. The communication camp promoted language functions that are less likely to represent daily communication. That is, children with HL were not often able to generate spontaneous, functional utterances. Future research could highlight the differences in social communication when children with HL are sampled in multiple contexts, such as at home versus at school.

Second, researchers could control for the severity degree of HL. Different severity levels could impact the development of social communication. This may also impact a participant’s willingness to produce expressive language. While the present study included both mild and profound HL levels, a more detailed study with a greater number of participants would be useful to determine the relationship between HL and successful communication.

Third, future studies could focus on the social communication differences between children with HL that wear amplification devices or cochlear implants, and those that do not. Again, this study could include multiple communication environments with different communication partners.
Fourth, future researchers should consider using chronological age for comparison between children with HL and children with typical hearing. It is possible that our use of hearing age could have impacted the types of social communication strategies across both groups of participants. Using chronological age would eliminate any immature pragmatic components among children with typical hearing.

Future research should focus on these ideas while taking into consideration the importance these findings have toward clinical practice. By forming an understanding of the ways children with HL use social communication, practitioners and researchers can better serve their clients through creative intervention strategies.
References


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