This study evaluated grammatical morphology use in conversational language samples of children with and without hearing loss. Additionally, we compared tense marking of children with hearing loss in spontaneous versus elicited contexts. Over time, the longitudinal study will compare developmental trajectories of children with hearing loss and children with normal hearing and identify early predictors of later literacy achievement. The ELLA study is funded by an NIH NICDD R03 (RRO2DC014535-01) awarded to the fourth author.

BACKGROUND

Language sampling can be a rich source of data on children's language abilities in natural contexts. Analysis of these samples can give clinicians a glimpse into the performance levels in the areas of vocabulary, syntax, semantics, and pragmatics as well as how a child integrates all of these to communicate (Leahholm & Miller, 1994). This study utilized conversational language samples of preschool children with hearing loss guided by the Hadley Protocol (Hadley, 1999), as well as elicited tense-marking tasks of the Test of Early Grammatical Impairment (Rico & Wexler, 2001).

Although limited research has been conducted in this area with children with hearing loss, some studies have revealed a gap in grammatical morpheme use between children with hearing loss and children with normal hearing. McGuckian and Henry (2007) found children with hearing loss produced less possessive -s and plural -s relative to children with normal hearing; however, their productions of irregular past tense verbs, articles, and progressive tenses were higher than controls. The key difference between children with hearing loss and children with normal hearing lay in the order of accuracy of each morpheme within the groups. For example, children with normal hearing had the highest accuracy for the possessive -s morpheme, but children with hearing loss were less accurate on this morpheme.

Additionally, Norbury, Bishop, and Bresciane (2001) compared children with specific language impairment and mild-to-moderate hearing loss. They found that children with mild-to-moderate sensorineural hearing loss marked third person singular -s and past tense –ed morphemes with less accuracy than age-matched peers with normal hearing (82 versus 98% and 63 versus 82%, respectively). Children with mild-to-moderate hearing loss outperformed children with specific language impairment, however (82 versus 52% and 63 versus 30%, respectively). These studies provide evidence of the variation in grammatical morpheme usage between children with hearing loss and children with normal hearing and point to a need for more research to be conducted in order to gain a better understanding of these discrepancies.

METHOD

In the ELLA study, preschool children with and without hearing loss complete a battery of early language and literacy assessments, including conversational language samples and the Test of Early Grammatical Impairment (TEGI; Rico & Wexler, 2001), every six months from age 4 to 6. This poster presents findings from the language samples and TEGI from the initial testing session. Participants were matched for age (± 4 months) and expressive language (± 1 raw score point on the expressive subtest of the Test of Early Language Development – 3rd Edition [Heeke, Reid, & Hammill, 1999]).

Language Sample Collection Protocol

Language samples were collected via audio recorder for all participants. The lab director (a certified, licensed SLP), graduate SLP students, and trained research assistants employed in URC’s Written Language Lab utilized the Hadley Protocol (1996) to elicit spontaneous conversational language from each participant. The Hadley protocol consists of three four-minute blocks. The first block elicits elicits personal narratives, such as stories about a favorite childhood experience, toys, pets. The second block elicits explanations of concrete actions, such as sports and games, and the third block elicits retelling of favorite movies, TV shows, and books. Mean time of language sample collection was 12.95 minutes for CHL and 12.05 minutes for CNH.

Results of Popular TV shows (e.g., Paw Patrol, Dora The Explorer), movies (e.g., Frozen, The Lego Movie, Minions), and other topics (e.g., pets, sports) were used for conversational support.

Transcription Process

Language samples were transcribed using a 3-step process. Step 1 was designed as a first pass in transferring the conversation to written form. Child and adult utterances were transcribed. Trained undergraduate and graduate students completed Step 1. Step 2 was devoted to transcription accuracy. Trained lab employees and graduate SLP students carefully checked transcriptions and made changes as needed. Finally, Step 3 was designed to verify transcription accuracy. Senior lab members not involved in Steps 1 or 2 performed the final pass for each transcription.

Grammatical Morphology Coding Scheme

After transcription was complete, samples were coded for Brown's morphemes (see below). A trained lab member coded the samples, and the lab director checked the coding. Samples were then analyzed in SALT.

RESULTS

Standard Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>CHL Mean (SD)</th>
<th>CNH Mean (SD)</th>
<th>p</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLUen</td>
<td>4.19 (1.83)</td>
<td>5.08 (1.51)</td>
<td>216</td>
<td>0.52</td>
</tr>
<tr>
<td>NWD</td>
<td>170.75 (58.73)</td>
<td>170.75 (58.73)</td>
<td>0.05</td>
<td>0.00</td>
</tr>
<tr>
<td>TTR</td>
<td>6.41 (0.09)</td>
<td>6.50 (0.05)</td>
<td>147</td>
<td>0.05</td>
</tr>
<tr>
<td>Words per Min</td>
<td>49.37 (16.14)</td>
<td>50.14 (16.14)</td>
<td>163</td>
<td>0.59</td>
</tr>
</tbody>
</table>

Relation of Spontaneous versus Elicited Tense Marking in CHL for MLU.

For CHL, accuracy in spontaneous tense marking was significantly correlated with elicited tense marking on the Test of Early Grammatical Impairment.

IMPLICATIONS

This study has several implications for language assessment and intervention in children with hearing loss:

- Effect sizes suggest that CHL perform lower than CNH on many standard measures of language acquisition, including MLU and number of different words.
- CHL do not use tense-related morphemes and BE verbs as accurately or frequently in conversational language as CNH, even when matched on expressive language score on a widely-used early language measure.
- Tense-marking morphemes can be evaluated using elicited (i.e., TEGI) or spontaneous context.

Study implications are significant to professionals working with CHL. These findings are consistent with numerous research articles that report CHL lag behind age-matched peers in measures of expressive language, specifically emerging grammatical morphology. Thus, it is important for SLPs to anticipate specific difficulties in these areas of expressive language and access appropriate methods to assess spontaneous and elicited emerging grammatical morphology. Tense-marking morphemes, including 3rd person singular and past tense –ed, and BE verbs in general should be closely monitored and targeted throughout early intervention. Additional intervention targets for this population may include non-tense grammatical morphemes, such as possessive –s and preposition –on.

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