

Nonverbal Communication Judgment in Siblings of Nonverbal Children

by

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SIBLING NONVERBAL COMMUNICATION JUDGMENT

NONVERBAL COMMUNICATION JUDGMENT IN SIBLINGS OF NONVERBAL
CHILDREN

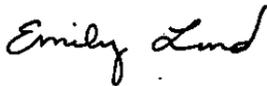
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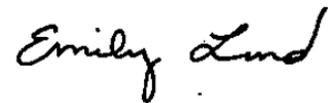
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Abstract

The purpose of this study is to assess nonverbal communication judgment in siblings of nonverbal children. In particular, this study assesses how a typically developing sibling of a nonverbal child understands nonverbal communication acts. It hypothesized that siblings of nonverbal children would have an increased recognition of nonverbal communication compared to one child from a typical developing sibling dyad, performances of these children would not be at ceiling, and we predicted that older children would be better at recognizing nonverbal communication than younger children. The results indicate that siblings of nonverbal children comprehend nonverbal communication at a rate similar to siblings of a typically developing child, older children are able to recognize nonverbal communication at a higher rate than younger children, and children who can identify nonverbal acts depicting behavioral regulation are also likely to identify social interaction and joint attention at higher rates. This study provides preliminary evidence to support future research on the use of siblings of nonverbal children as participants in speech-language therapy, siblings of typically developing children in classrooms with language disorders students, and presents areas of growth in the nonverbal communication judgment skills of children.

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Introduction

Siblings spend over half of their free time engaged in activities together. This decreases the time a child spends in the presence of a parent (Dunifon, Fomby & Musick, 2017). Intentional communication occurs in sibling relationships and can occur verbally or nonverbally (Wetherby, et al., 1984). Unfortunately for some children, intentional communication never will occur verbally as a result of a communication disorder (Chapman & Hesketh, 2000; Anderson et al., 2007). There is little known about children with nonverbal siblings and how sibling understanding of nonverbal communication may be affected. The purpose of this study is to analyze comprehension of nonverbal intentional communication in siblings of nonverbal children.

Literature Review

Transactional and Intentional Communication

Communication requires more than one speaker and therefore must occur in a transactional context. This means that when a child learns to communicate, he or she is influenced by communicative partners and the environment (Sameroff & Fiese, 2000). The most commonly studied communication partner is typically a child's mother. A mother directly contributes to a child's reaching of his or her developmental linguistic milestones and teaches essential language skills early on. Maternal responsiveness has been linked to development of different areas of linguistic development such as imitation and early expressive language (Tamis-LeMonda, Bornstein, & Baumwell, 2001).

Communication begins even before a child speaks his or her first words. This is called prelinguistic communication and it develops before verbal communication. Prelinguistic communication is classified as intentional communication, meaning the communication act has a

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motoric or vocal act towards an adult that waits for a response (Harding, 1984). Intentional communication is further broken down into three forms. The first is behavioral regulation, such as requesting objects or actions and protesting. Next is social interaction, which is comprised of requesting social routine, showing off, greeting, calling, acknowledgment, and requesting permission. Last is joint attention. Joint attention is made up of commenting, requesting information, and clarification (Bruner, 1981; Coggins & Carpenter, 1981; & Wetherby & Prutting, 1984).

Wetherby, Cain, Yonclas & Walker (1988) studied intentional communication in typically developing children from the pre-linguistic stage up to the multiword stage. Children were assessed via language sampling over the course of a year. This study found that children were using 26.1-55.8 gestural intentional communication acts during a 30-minute period in the prelinguistic stage (12 months). On average, the participants were using 1 act of intentional communication per minute. These nonverbal communication acts also carried over into the one-word and multiword stages (16 & 24 months). Overall, the study found that children use all three types of intentional communication during the prelinguistic stage. Lack of this prelinguistic intentional communication may act as an early predictor of a communication disorder.

Nonverbal communication, from a transactional perspective, helps children and adults to understand the emotional state of others. Emotional states can be understood based on a person's nonverbal behaviors. In particular, facial expressions are a contributor to a message being communicated. Frijda (1953) found that making a judgment on somebody's expressive meaning is largely derived from nonverbal behaviors. Thus, nonverbal communication retains its value even after a child has moved into a stage of verbal communication.

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Sibling Role in Language Development

Some children who experience language disorders, particularly those who experience language disorders secondary to another developmental condition (e.g., Autism Spectrum Disorder or Down Syndrome), display difficulty moving out of the period of nonverbal communication (Chapman & Hesketh, 2000; Anderson et al., 2007). These children, as they grow older, may not learn to use words in the same way as their typically developing peers. Thus, their families have to rely more heavily on the child's use of nonverbal communicative acts to complete their activities of daily living.

Having a child with atypical development changes the dynamics of the family (Luterman, 2008). Specifically, sibling relationships differ when one child exhibits some sort of disorder as compared to when neither sibling experiences atypical development. Some siblings exhibit positive interactive behaviors when one child has a speech or language disorder. These children have positive relationships when together and the typically developing child often takes on the role of protector and interpreter for their speech impaired sibling (Barr, McLeod, & Daniel, 2008). Siblings, like mothers, are likely to influence learning and development of early skills. As siblings interact together, they develop a resemblance in nonverbal language expression and communication (Blanck, Zuckerman, DePaulo, & Rosenthal, 1980). Due to this resemblance, siblings have a unique understanding of each other's needs.

Siblings play an important role as a communication partner of children with language-disorders and should be included in interventions (Shrivers & Plavnick, 2015). They are able to function as teachers for their disabled brother or sister. A pilot study on teaching children to support the complex communication needs (CCN) of a sibling showed that children can be trained to increase communication levels of their CCN sibling. (Douglas, Kammes, Nordquist, &

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D'Agostina, 2018). Research by Cash and Evans (1975) trained older siblings of children who would now be identified as intellectually disabled to prompt, model, give verbal information, call attention, and use appropriate reinforcement. They found that the trained siblings used the teaching behaviors at a high frequency following a modeling film. However, beyond these articles, there is minimal literature on the behaviors of typically developing children who have a sibling with a communication disorder (or, in particular, a sibling who is nonverbal).

Previous research has examined the psychosocial affect having a sibling with a disability has on other typically developing siblings in the family. Eisenberg and Blacher (1989) found that siblings of disabled children reported increased levels of empathy, maturity, patience, honesty, acceptance of differences, ability to offer and give help to others, ability to cope with stress, appreciation of health, and family closeness. However, the question has yet to be asked if having a sibling with a disability affecting their language has an effect on the typically developing sibling's language and if increased empathy is related to an increased ability to understand the nonverbal communication linked with how certain emotions present. We do not yet know if all children are able to interpret nonverbal communication similarly or if children who have a disabled sibling can interpret nonverbal communication better because of their prior exposure to nonverbal communication with their disabled sibling.

When interventions are implemented by communication partners other than therapists or parents, gains in multiple areas have been observed (Dunn et al., 2002). In a systematic review of peer mediated intervention (PMI) literature, Dunn found a medium effect size of peer mediated interventions on academic outcomes. In a study published in 2020, Bambara, Cole, & Thomas implemented PMIs to address conversational difficulties in students with ASD and found that PMI was highly effective in increasing responsiveness to conversation partners and

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acknowledging the interests and feelings of conversational partners. An empirical review from Zagona and Mastergeorge (2018) found that when taught the skills needed to successfully interact with peers with ASD, the peers of focus demonstrated an increase in social-communication skills. Siblings of children considered nonverbal have the potential to also function as PMIs and may already have an established understanding of nonverbal communication and therefore be able to more easily assume the role of a PMI than a peer that does not have a disabled sibling.

Although there is research regarding sibling relationships in general, and similarities in language expression and function for those siblings, there is little knowledge about sibling recognition of nonverbal communication acts and the malleability of this recognition. As previously stated, the communication partners commonly evaluated are parents (Tamis-LeMonda et al., 2001), but siblings are also a major communication partner. Specifically, there is a lack of research amongst nonverbal children and their typically developing sibling. A first step in this line of inquiry then, is to determine whether or not siblings of children who are nonverbal are able to interpret nonverbal communicative acts well.

Research Questions

- (a) Do siblings of nonverbal children have an increased recognition of nonverbal communication compared to peers with only a typically developing sibling?
- (b) Is there an effect of age on recognition of nonverbal communication?
- (c) Do scores on recognizing one type of communication act correlate with scores on another type of communication act?

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The working hypothesis was that siblings of nonverbal children would have an increased recognition of nonverbal communication compared to one child from a typical developing sibling dyad, as a result of having interacted frequently with a minimally verbal sibling. However, we also predicted that performances of these children will not be at ceiling (Lund, 2018). Additionally, we predicted that older children would be better at recognizing nonverbal communication than younger children.

Methods

Participants

The primary variable of interest in this study was the performance of typically developing siblings – thus, the group with a nonverbal sibling (henceforth the TD-NV group) included 6 children, and the group with a typically developing sibling (TD-TD group) included 6 children. The nonverbal children were aged between 5 years 0 months to 7 years 9 months. Typically developing siblings ranged in age from 4 years 2 months to 9 years 3 months. Typically developing sibling pairs were age matched. All sibling dyads were exposed primarily to English in their home environments. One sibling dyad was exposed to Portuguese 20% of the time in their home environment. All typically developing participants communicated using spoken words and nonverbal siblings communicated using single words, signs, gestures, and word approximation. All typically developing participants (not the minimally verbal sibling) had vision within normal limits except for one with visual impairments that did not influence participation. All participants had hearing within normal limits. Of the 12 typically developing participants, one had previously attended speech-language therapy and one was currently enrolled in speech-language therapy for speech sounds. Nonverbal participants had a vocabulary of fewer than 50 spontaneous words determined by the MacArthur-Bates Communicative

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Developmental Inventory (MacArthur-Bates CDI; Fenson, Marchman, Dale, Reznick, & Bates, 2007) filled out by a parent, teacher or therapist. Typically developing sibling pairs met the same criteria as the typically developing children with nonverbal siblings with the exception of having a nonverbal sibling. The minimally participating sibling had language development within normal limits, per parent report.

Setting

Data collection occurred via virtual meeting through Zoom as a result of the COVID-19 pandemic. The participating child was seated in a chair in front of a computer or tablet. The examiner was seated in front of the computer monitor in a private room.

Materials

Study materials included differing nonverbal communication judgment videos, response record form, and procedure checklist. The nonverbal communication judgment videos were used for both the typically developing siblings and siblings of nonverbal children. The videos were of equal length and difficulty as determined by adult viewers of the video. Ten graduate students in a speech-language pathology program and two speech-language pathologists who are graduate faculty watched a set of nonverbal communication videos. All videos used for the experimental assessment were unanimously agreed upon by the ten graduate students and two graduate faculty.

Experimental Design

This study employed an across-groups comparison. Both groups were assessed at only one time point and responses were compared.

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Response Definitions and Measurement System:

Experimental Assessment. Child assent was obtained prior to any testing. The primary experimental assessment in this study was a nonverbal communication judgment task administered via video to yield a dependent variable defined as number of correct communication judgements. Videos depicted nonverbal communication acts from three categories: behavioral regulation, social interaction, and joint attention (Wetherby & Prutting, 1984) listed in the table below:

Table 1 Categories of Nonverbal Communication

| Behavioral Regulation | Action |
|------------------------------|---|
| Request object | Child reaches toward or points desired toy |
| Request action | Child puts hand on lid of jar while looking at adult to request help |
| Protest | Child pushes object away or turns away from given object, says “no” or whines |
| Social Interaction | |
| Request social routine | Child places hands in front of face to signal desire to play peek-a-boo |
| Showing off | Child presses button on a toy, looks at adult and laughs |
| Greeting | Child waves at person entering the room |
| Calling | Child vocalizes and waves for adult across the room |

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| | |
|------------------------|--|
| Acknowledgment | Child nods after being told directions by adult |
| Request permission | Child looks at adult to receive permission (e.g., head nod, verbal “yes”) to carry out an action |
| Joint Attention | |
| Comment | Child holds up toy to adult and smiles when looking at adult |
| Request information | Child points to a picture in a book and looks at the adult for information |
| Clarification | Child repeats/modifies communicative act after adult asks for clarification |

The assessment consisted of 18 videos of the following communicative intents: one showing off, three comments, two request actions, three protests, one request social routine, two request objects, two greetings, one request permission, one acknowledge, one request information, and one call.

Participants were instructed to watch a communicative act and then verbally state what happened in the video. The videos were paused between communicative acts to obtain the child’s response. All answers were in response to the question, “What is he/she saying?” A correct response stated what the function of the communication act was. Answers that stated what happening in the video without an intent did not count as correct responses. For example, a correct response to a video of a child throwing a book and whining would be, “She doesn’t want

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the book” or “She doesn’t want to read”. An incorrect response to this item would be, no response, an off-topic response, “She likes the book”, or “I don’t know”. Correct responses could be either a partial (i.e., “Doesn’t want the book”) or a full sentence (i.e., “She doesn’t want to read the book”), as long as the answer contained a statement of the correct communicative function.

The video responses were recorded, then transcribed following Systematic Analysis of Language Transcripts (SALT) conventions (Miller, J. & Iglesias, A., 2012) and systematically scored for nonverbal communication judgments. Typically developing siblings were assessed via a language sample that was analyzed for developmental norms and parent report of no current language delay diagnosis.

Interobserver Agreement. Interobserver agreement was assessed by having and observer blinded to study conditions and participant group membership watch a video of participants completing the nonverbal communication probe and scoring the child’s responses compared to the examiner’s recorded responses. Agreements are when both observers’ scores were identical, and disagreement was when scoring did not correspond. The number of agreements was divided by the total number of behaviors coded and then multiplied by 100. Reliability was assessed in 25% of sessions for each sibling dyad (Hancock, 1996). Reliability scoring resulted in 91.66% agreement.

Results

The first research question addressed whether typically developing siblings of nonverbal children could interpret nonverbal communication acts with higher accuracy compared to age-matched siblings of typically developing children. Participant scores can be seen in Table 1. The participants were presented with videos depicting nonverbal communication acts and asked to

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verbally state what was being communicated. The TD-NV participants ($M = 5.33$, $SD = 3.77$) compared to the TD-TD participants ($M = 6.16$, $SD = 5.74$) demonstrated similar nonverbal communication judgment scores overall.

Table 2 Participant Scores by Group and Category

| Statistic | Total Score | Behavioral Regulation | Social Interaction | Joint Attention |
|-----------|-------------|-----------------------|--------------------|-----------------|
| TD-NV | | | | |
| M | 5.33 | 3.33 | 1.00 | 1.00 |
| SD | 3.77 | 2.72 | .000 | 1.09 |
| TD-TD | | | | |
| M | 6.16 | 4.16 | 1.00 | 1.00 |
| SD | 5.74 | 3.86 | .894 | 1.26 |

An independent samples t-test indicated no significant differences between groups, $t(10) = .297$, $p = .773$ for the total scores. Because there were no significant group differences found, total scores were broken down by type of communication act (behavioral regulation, social interaction, joint attention) and an independent samples test indicated no significant difference between groups for type of communication act: behavioral regulation, $t(10) = .413$, $p = .676$, social interaction, $t(10) = .001$, $p = 1.00$, joint attention, $t(10) = .001$, $p = 1.00$. Scores between groups for social interaction and for joint attention acts were particularly similar between groups and there was not substantial variation: most children could identify one act from each category. There was more variation captured for responses to behavioral regulation acts, but groups remained remarkably similar overall.

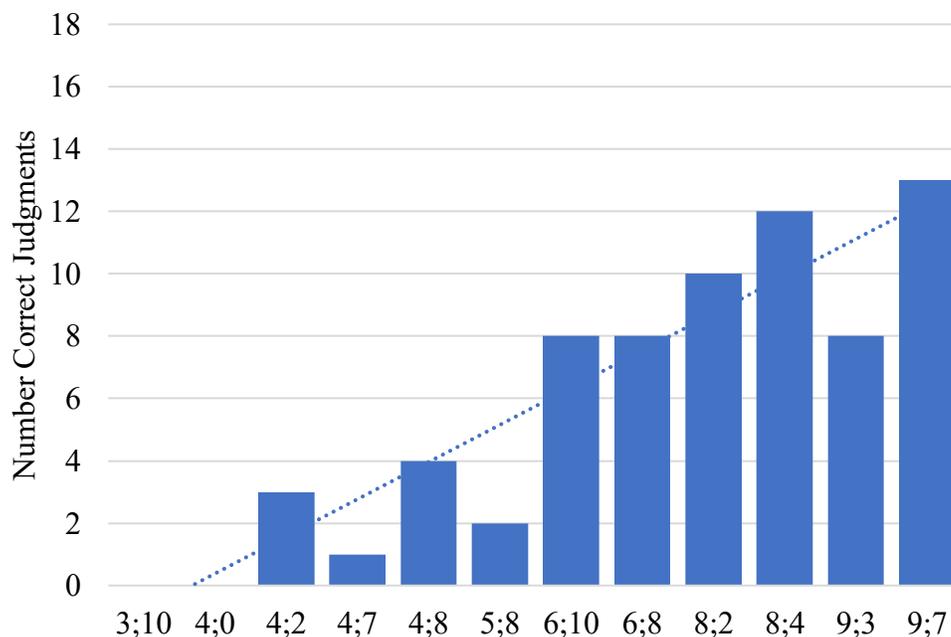
The second research question asked if there was an effect of age on the recognition of nonverbal communication. Specifically, we wanted to know if older children were able to recognize nonverbal communication acts with higher accuracy than younger children. To answer this question, the total number of correct answers was analyzed in a correlation with the

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participant's age in months. A Pearson correlation analysis was conducted to determine the correlations and indicated strong correlations for age and total score ($r = .921, p < .001$), and then for subcategories, there was a correlation between age and behavioral regulation ($r = .896, p < .001$), a moderate correlation between age and social interaction ($r = .565, p < .001$) and a strong correlation between age and joint attention ($r = .937, p < .001$). This indicates that participants who are older, in general, are more likely to recognize communication acts related to behavioral regulation, social interaction, and joint attention.

Figure 1

Total Scores by Age



The third research question asked whether participant scores for one type of communication act correlated with scores for other types of communication acts. A Pearson correlation test indicated that high scores on behavioral regulation strongly correlated with high scores on social interaction ($r = .608, p = .036$) and joint attention ($r = .900, p < .001$). There was

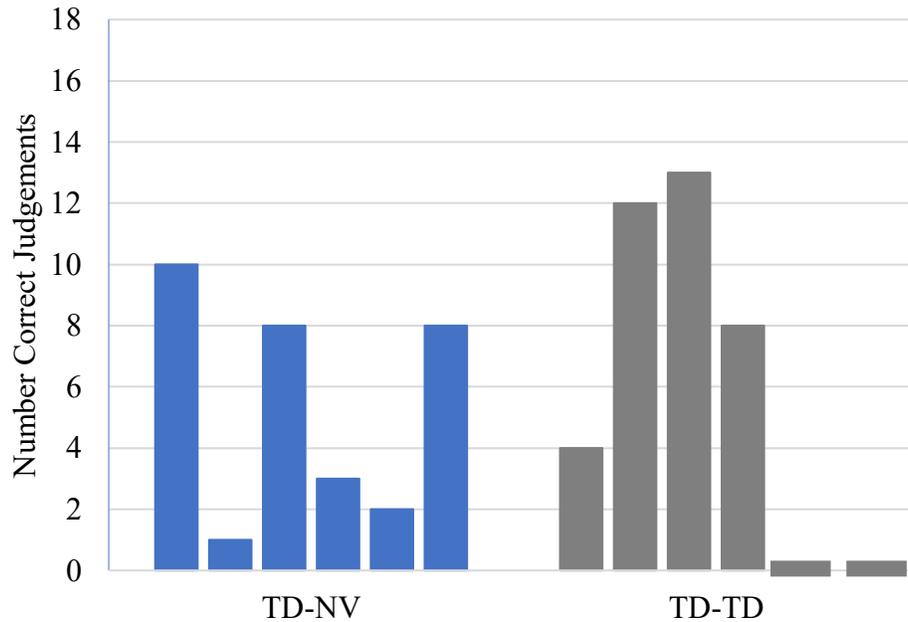
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not a significant correlation between score for social interaction items and joint attention ($r = .535, p = .073$). This finding indicates that participants who scored high on behavioral regulation recognition were also likely to score high on social interaction and joint attention recognition. A lack of a significant finding between scores on joint attention and social interaction may relate to the lack of variable responses across both types of communication acts (i.e., most participants were only able to identify one).

A post-hoc descriptive analysis of the effect of age and group was explored; the present study was not sufficiently powered to detect an interaction effect statistically, but descriptive information is useful for the generation of future hypotheses. We considered whether those children who were younger than their nonverbal sibling were able to identify more communication acts than children who were younger than their matched, verbal sibling. We found that one participant, a TD-NV younger sibling participant, was able to identify two on the nonverbal communication acts while their matched TD-TD participant scored a zero on the nonverbal communication judgment. Another TD-NV younger sibling participant scored a one on the nonverbal communication judgment and the matched TD-TD participant also scored a zero on the nonverbal communication judgment.

Figure 2

Total Scores by Group



Discussion

The purpose of this study was to analyze comprehension of nonverbal intentional communication in siblings of nonverbal children. We observed that children with a nonverbal sibling were able to identify nonverbal communication acts. Additionally, children with a younger sibling were better to identify nonverbal communication acts, in general, than children without a younger sibling. We also observed, descriptively, that younger siblings of nonverbal children were able to identify nonverbal communication acts at a higher rate than those younger siblings of typically developing children. Finally, there was a high correlation between scores on behavioral regulation and joint attention, and between behavioral regulation and social

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regulation, indicating that children who were skilled at recognizing behavioral regulation were also skilled at recognizing the other types of communication acts.

High scores on naming behavioral regulation communication acts were observed across all participants. It is possible that this is due to a difference in nonverbal sibling etiologies. For example, children with ASD exhibit fewer instances of joint attention and social interaction than behavioral regulation (Wetherby & Prutting, 1984) so siblings of children with ASD may have less practice interpreting joint attention and social interaction acts than siblings of children with other diagnoses. Children with Down Syndrome tend to rely more on communicating via joint attention due to expressive language deficits and therefore demonstrate strength in nonverbal communication (Mundy et al., 1995; Mundy et al., 1988). The influence that a disabled sibling's diagnosis has on their use of different types of nonverbal communication should be considered when examining what typically developing siblings understand and can present areas for growth in nonverbal communication comprehension.

Second, it is possible that all children tended to better interpret acts of behavioral regulation than joint attention or social interaction because behavioral regulation is easier to describe. Words associated with behavioral regulation communication act include words like "want" "ask" and "help," which are early-developing vocabulary words (Fenson, Marchman, Dale, Reznick, & Bates, 2007) and easily identified. Words associated with interpreting joint attention acts, on the other hand, include words like "think" and "like," which reflect the mental states of others. Mental-state words are associated with complex syntax, and with theory of mind (understanding others' feelings). Better interpretations of behavioral regulation acts may reflect that the language used to describe these acts is more straightforward than the language used to describe joint attention or social routines.

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Given the results of this study, we should take into consideration the role that siblings of nonverbal children have as communication partners and the potential influence siblings can have in speech-language therapy for nonverbal children. The similarity in the communication judgment scores of TD-NV and TD-TD participants shows that siblings, particularly older siblings, are able to interpret nonverbal communication acts. Thus, siblings of children who are nonverbal may be able to play a role in therapy as a supportive communication partner. Similar to previous studies that have instructed parents how to use language supports, such as linguistic mapping (Yoder, Warren, Kyounggran, & Gazdag, 1994; Yoder & Warren, 2001), siblings could be give guidance on how to provide language support to their nonverbal sibling throughout the day.

Siblings have a different relationship with each other than with their parents, and therefore could provide a unique communicative context for speech-language therapy. Siblings influence each other's development and growth (Dunn, 2007; Azmita & Hesser, 1993) much like how a parent influences their child's development. Sibling relationships are, for example, emotionally intense and foster the development of social support and social understanding (Dunn, 1998). Interactions between siblings are uniquely intimate and siblings have access to interactions with each other that are different than interactions with parents. For example, siblings have high rates of conflict (Dunn & Munn, 1986) and conflict resolution can aid in development of perspective taking skills, emotional understanding, and conflict resolution (Brown, Donelan-McCall, & Dunn, 1996; Howe, Rinaldi, Jennings, & Petrakos, 2002). This finding may not be limited to only older siblings of nonverbal children: the findings of this study indicate that older siblings from the TD-TD group could be taught to interpret nonverbal communication acts as well, therefore enhancing the typically developing sibling relationship.

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Previous research has found that siblings of children with disabilities participate in more caregiving activities than typically developing siblings do (Cuskelly & Gumm, 2003). Some siblings of children with disabilities have reported feelings anxious, stressed, or confused because of their sibling's disability (Azeez, 2002; Siegel and Silverstein, 1994). It is possible that the sibling relationship developed from difficult experiences emphasizes the importance of a speech-language pathologist partnering with siblings of children with disabilities to empower the sibling to provide language supports without increasing negative emotions.

This study also has implications for older students, whether or not they have a nonverbal sibling, as communication partners. Older (e.g., 8-year-old) children in the present study were able to identify nonverbal communication acts. If these children are peers in a classroom setting to another child who is nonverbal, it is possible that older children could also be coached as communication partners. Peer-to-peer interaction is important within the classroom (Nguyen, Cannata, & Miller, 2018; Webb, 1989; Johnson, 1981) knowing that children who do not have experience with nonverbal siblings are still good interpreters of nonverbal interactions is encouraging. Future studies could harness this finding to explore whether nonverbal students' peers might provide a unique communication opportunity and practice.

A descriptive analysis of younger siblings explored in this study revealed that younger siblings of nonverbal children judged nonverbal communication more accurately than younger siblings of typically developing children. It is possible that if additional younger siblings of nonverbal children had been recruited, we could have further examined whether this difference applies to a wider population of younger siblings of nonverbal children. It is possible this finding is a result of experience: children who were older siblings of other typically developing children did, at one point, have a nonverbal sibling. That is, younger siblings are nonverbal

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communicators as infants. The older sibling likely received exposure to nonverbal communication acts much like what younger siblings of nonverbal children have seen. Being the younger sibling of a child with disabilities is a unique scenario but may also represent the area where the greatest advantage to having a nonverbal sibling is apparent. In the case of siblings of children with disabilities in general, the advantage these siblings may revolve around empathy, increased maturity, and advocacy rather than gains in language scales. However, the ability to interpret nonverbal acts of communication may play an important role in advocacy and recognizing times when one must advocate for themselves or a family member.

Parents are the typical communication partners evaluated but siblings also play a role in communication with a child with a language disorder. It is important to consider the role of older and younger siblings in the communication development of a language disordered child and the effects that the language disorder has on the typically developing sibling(s). Typically developing siblings of nonverbal children were able to identify nonverbal communication acts at a similar rate to those children with a typically developing participant and therefore have the potential to use that knowledge to participate in the interventions of language disordered children. Due to the transactional nature of communication, a variety of communication partners and environments can influence a child's language development. Multiple communication partners with the ability to understand nonverbal communication acts may present an avenue for therapists to further engrain therapeutic targets into the home environment of a language disordered child.

Limitations of this study provide a basis for future studies of siblings of children who are nonverbal. First, the COVID-19 global pandemic shifted the planned study from an in person, intervention-based study to a telehealth, descriptive model that solely examined how siblings of

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nonverbal children understand nonverbal communication rather than how they can play a role in intervention. It is possible that the move to a virtual medium affected performance: children were asked questions by the examiner virtually, rather than in person. One of the challenges of virtual study circumstances is that children (including young children) are often distracted by their environment. Children in this study participated from their homes; many times, they had to be redirected. Additionally, some children appeared somewhat shy with the examiner. Even though there were some warm-up activities, it is possible that these results under-represent what children knew about nonverbal communication, and that it would have been easier to connect with children in-person.

Second, recruitment was somewhat limited due to the population being studied. Children who are nonverbal represent a small proportion of the population, and often participate in large quantities of therapies and other support services. Because this study recruited participants during a global pandemic, it is possible that families were even less prone to participation as a result of increased life stress. Recruitment challenges did not allow the investigators to purposefully recruit similar numbers of children who were older than a nonverbal sibling and younger than a nonverbal sibling. If more older siblings had been recruited then there may have been a different effect seen, and if younger siblings of nonverbal children were recruited into the study then the difference between younger siblings of typically developing vs nonverbal siblings could have been explored further.

An additional limitation is that the videos used in this study showed age-appropriate nonverbal communication acts. That is, the study videos captured nonverbal communication acts that occurred in the lives of typically developing (often younger) children. It is possible that these acts were not consistent with the experience of siblings in the TD-NV group: children who

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remain in the nonverbal stage probably do not appear to communicate nonverbally in exactly the same way as a 12-month-old child might. It is possible if the stimuli changed to reflect nonverbal communication from older, nonverbal students, that a clearer advantage would have been observed.

Finally, this study required siblings of nonverbal children to be typically developing themselves. Many disabilities, including Autism Spectrum Disorder, have a genetic component: that is, a child with a sibling with ASD is at higher risk for ASD themselves than a child who does not have a sibling with ASD. The inclusion criteria of the present study did not take into account whether a communication disorder would affect nonverbal communication interpretation. Future work might explore whether a child who him/herself has ASD and has a sibling with ASD is at an advantage over a child with ASD who had no sibling to learn from. Additionally, it is possible that the children in the present study were at higher risk for sub-clinical deficits not captured by our screening (language sample). If that is the case, then our groups were perhaps not fully comparable, which would make the similar results between groups more impressive.

In conclusion, these findings provide preliminary evidence on the abilities of children with a nonverbal sibling and of children with a typically developing sibling to judge nonverbal communication. Differences in scores by type of communication could be due to differences in disabled sibling etiology. Siblings of nonverbal children and typically developing children could play a beneficial role in therapy due to the unique characteristics that arise from sibling relationships. Speech-language pathologists should work to increase family participation in therapy while taking into consideration the affect a disabled child has had on the family as a whole. Utilizing a sibling's ability to understand nonverbal comprehension as a tool in therapy

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may help to help increase the typically developing sibling's understanding of nonverbal communication and ability to socially support the sibling while encouraging language use.

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