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Infant Sign in Relation to Development

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Preverbal children around the world use gestures to communicate before they have words to do so (Vallotton, 2012). Variations in children's gestures remain an important predictor of children's later language and social skills (Vallotton, 2012). Infant sign language includes gestures in preverbal children. There is evidence to support that infant sign does not impede verbal development, that there is a positive relationship between infant sign and development, and finally that infant sign can enhance mother-infant interactions (Thompson et al., 2007).

Enhancing Early Communication through Infant Sign Training

Infant sign training may provide an effective means of communication (Thompson et al., 2007). Thompson and colleagues (2007) held two different experiments that looked at infant sign. The first experiment was designed in attempt to extend onto a previous experiment that was done in 2004 by Thompson, McKerchar and Dancho, which described a set of procedures that was effective in producing signing in three infants (Thompson et al., 2007). Thompson et al. (2007) investigated teaching infant sign to caregivers by delaying physical prompting and reinforcement for both prompted and independent signs. The first experiment of this article was designed to improve a limitation of the Thompson et al. (2004) study which was that signing was taught and measured only under controlled experimental conditions making it unclear whether sign training resulted in functional communication (Thompson et al. 2007). The purpose of the first experiment of this article was to evaluate the effects of delayed model and physical prompts and reinforcement on the achievement of signs in two infants (Thompson et al. 2007). A difference between this experiment and the Thompson et al. (2004) was that this experiment added a model prompt in addition to physical prompting (Thompson et al., 2007).

The two participants were a 10 month old with Down syndrome, Heather, and a typically developing six month old, Betty (Thompson et al., 2007). Heather was taught to request an

assortment of toys using the ASL sign for “please” and experimenter attention and Betty was taught to request a bite of baby food and brief experimenter attention. Observers recorded the frequency of independent and prompted signs.

The experimental design was initial baseline, sign training, reversal to baseline, ending with sign-training extension (Thompson et al., 2007). The sessions were conducted in a small therapy room that consisted of a one-way observation window, and then they were later migrated into school and in-home settings. Sessions were five minutes long and were conducted as many as three times throughout the day, five days a week, and were conducted so that the sessions did not interfere with the child’s daily routines such as naps and their eating schedules (Thompson et al., 2007).

Heather did not sign during the initial baseline (Thompson et al., 2007). The sign that was being observed for Heather was “please,” defined as the palm of one hand touching the chest while moving back and forth (Thompson et al., 2007). Around session 57, the observers noticed a gradual increase in independent signing and high, stable levels of independent signing were achieved without prompts (Thompson et al., 2007). An immediate decrease in independent signing was observed on the return to baseline and increased again when sign was extended across listeners, reinforcers, and settings. Betty also did not sign during the initial baseline. Initially during training, independent signing was observed with a 10-second delay to the model prompt and high levels of signing were maintained with minimal prompting as the delay to the model prompt increased to 35 seconds (Thompson et al., 2007). Independent signing decreased immediately when they removed the model prompt and returned to baseline (Thompson et al., 2007). When sign training was reinitiated, Betty’s independent signing increased and maintained at high levels even as the delay to the model prompt was increased (Thompson et al., 2007).

Independent signing remained high even when they changed Betty's environment and when they changed who was conducting the experiment and model prompts, which varied to an experimenter, a teacher, and her father in therapy rooms, classrooms, and their home (Thompson et al., 2007).

In conclusion, there is evidence to support that infant sign does emerge before spoken language and can be a useful tool in helping infants to communicate their needs and wants to their caretaker (Thompson et al., 2007). There is also a strong correlation and relationship between infant sign and overall development, regardless of the level of disability (Thompson et al., 2007).

In the second experiment, it was the goal to replace infant whining/crying with meaningful signs (Thompson et al., 2007). The signs were taught using similar procedures to the first experiment and crying and whining were put on extinction (Thompson et al., 2007).

Participants were two, typically developing infants (Thompson et al., 2007). Geoffrey, a 10-month old was taught a signed request, "please," for experimenter attention and toys (Thompson et al., 2007). Lyle, a nine-month old, was taught to sign "up" when he wanted picked up by his mother (Thompson et al., 2007). Observers recorded the frequency of independent and prompted signs (Thompson et al., 2007). Sessions were conducted in a therapy room, were five minutes in length, were conducted one to four times per day, five days a week, and were scheduled so that they did not interfere with the children's daily routines such as naps or meals. The effects of sign training were evaluated by comparing baseline and sign-training conditions in a reversal design (Thompson et al., 2007).

Geoffrey rarely signed during the initial baseline and cried in every session (Thompson et al., 2007). Once sign was taught, Geoffrey showed very low levels of crying in sessions in which

he signed independently at high levels (Thompson et al., 2007). During Lyle's baseline, varying levels of crying and whining occurred with no independent signing (Thompson et al., 2007). His crying episodes were generally brief and of low intensity during experimental sessions, but the duration and intensity of crying increased as the delay to physical prompt increased to 15 seconds (Thompson et al., 2007). Independent signing gradually increased at the 30 seconds delay to the model prompt and remained high at the one-minute delay (Thompson et al., 2007). The duration of crying and whining decreased to very low levels when crying and whining emerged (Thompson et al., 2007).

In conclusion, when sign training is combined with extinction, a decrease in crying and whining was observed (Thompson et al., 2007). Given that children can learn signs as young as six months of age, sign training may provide an effective means of communication much earlier than the development of verbal communication (Thompson et al., 2007).

Infant Sign Language Program Effects on Synchronic Mother-Infant Interactions

Gongora and Farkas (2009) explored the effects of an infant sign language program using symbolic gesturing on mother infant interactions. Gongora and Farkas (2009) describe symbolic gesturing by including the following elements: (a) a type of gesture which can be used as a vehicle for communication between children and their families from a very early age, (b) communicative in function and carry their meaning in their form, appear between the ages of 10 and 24 months and are consistent over time, (c) play an important role in communication because for both parent and child, the goal of being able to communicate motivates both parties, and (d) are used by the child specifically to communicate something to another person (p. 215). Another aspect that Gongora and Farkas (2009) bring to the reader's attention is the idea of 'synchronic interactions' (p. 216). Rossetti's (2001) states "synchrony" involves the parents' adapting their

behavior to the rhythms of the child (p. 54). As the child's needs are met, caregiver confidence is increased and the parents learn to read the child's cues (Rosetti, 2001, p. 54). Affective synchrony between mother and child goes beyond simple imitation of expressions, but it allows for reciprocity, which is an essential aspect for the most favorable interactions in mother-child relationships (Gongora & Farkas, 2009; Rosetti, 2001). Visual, vocal, tactile, and affective interactions are also addressed in this article as important aspects for mother-child interactions (Gongora & Farkas, 2009; Rosetti, 2001). This study was based on a quasi-experimental longitudinal, descriptive, and comparative design (Gongora & Farkas, 2009). There were 28 participants; 14 mother-infant groups with the infants between the ages of five and nine months at the beginning of the study and the participants were middle or upper-middle socio-economic status (Gongora & Farkas, 2009). The goal was to describe the influence of an intentional infant sign language program on mother-infant interactions (Gongora & Farkas, 2009). The dyads were assigned randomly to the baby sign or control groups, and were then evaluated on three separate occasions. Observations took place during three, 15-minute free play sessions and the mothers were provided with toys and instructed to do whatever was normal for them and their child and the first session was used as a baseline (Gongora & Farkas, 2009). The baby signs program instructed mothers to encourage the use of symbolic gesturing by their children by consistently modeling symbolic gestures for them (Gongora & Farkas, 2009). For the control groups, two talks that focused on language development were held for the parents of these children and there was not any mention of communication through signing included (Gongora & Farkas, 2009). When data was collected, observers used the definition of synchronic: “ (a) one member of the dyad (mother or infant) initiate the interaction, and the other member have to follow it; (b) both members manifest an active and intentional search of interaction with the other; (c) the

interaction mode has to be the same (visual, vocal, tactile, or affective); (d) the affective tone of the interaction has to be positive; and (e) the goal to interact with the other member has to be an end by itself, not a mean for another activity” (Gongora & Farkas, 2009, p. 220). Each 15-minute session was divided into three, five-minute segments and was scored (Gongora & Farkas, 2009). These three scores were later used to get an average that represents the general performance of each dyad (Gongora & Farkas, 2009). The results suggest that there were significant differences between groups (Gongora & Farkas, 2009). The dyads that participated in the intervention had more frequent usage of symbolic gestures as compared to the control group, in which the use of symbolic gestures decreased over time (Gongora & Farkas, 2009). A form of symbolic gesturing is sign and according to both theory and existing research evidence, early synchronic interactions are crucial to the construction of a positive relationship between caregiver and child (Gongora & Farkas, 2009; Rosetti, 2001). Early infant sign can indeed enhance mother-infant interactions (Gongora & Farkas, 2009; Rosetti, 2001).

Implications for Low Socioeconomic Status

It is significant to look at various socioeconomic statuses because the availability of resources is vital to promoting development. Some of the most important factors to language acquisition are the economic advantages of children’s homes and the frequency of language experiences (Risley & Hart, 1995). Children who are born into homes with fewer economic resources typically learn fewer words, have fewer experiences with words in interactions with other people, and acquire their vocabulary more slowly (Risley & Hart, 1995).

This study differentiates from other studies by looking at the effects of promoting the use of symbolic gestures, as an infant sign intervention, on mother’s responsiveness in interactions

with their preverbal children and their perceptions of children's behavior (Vallotton, 2012). When examining preverbal communication through gestures, the author identifies that the gesture of pointing can only get an infant so far, because primarily, its function is for objects within the immediate visible moment (Vallotton, 2012). Both the role of parent and child are significant in development (Vallotton, 2012).

A child's own behavior can provide him with positive reinforcement; such as eliciting attention and a response from a parent or caregiver (Vallotton, 2012). When a positive response is elicited from a parent or caregiver; it provides positive reinforcement for the child to repeat that behavior and add new behaviors as well (Vallotton, 2012).

The initial sample of participants was 40 children and mothers that were enrolled in an Early Head Start Program, but the final sample included 29 families because 11 dropped out during the study (Vallotton, 2012). Data was collected in in-home visits (Vallotton, 2012). Materials from the Baby Signs Program with additional materials designed for the intervention were given to experimental group families to increase their use of infant signs (Vallotton, 2012).

The author compared the use of symbolic gesturing in the control and experiment groups to assess whether the intervention had an effect on use of symbolic gestures (Vallotton, 2012). The infant sign intervention increased the number of different symbolic gestures children and mothers used, the number of people using signs with the child, and the number of daily routines in which families used signs (Vallotton, 2012). This study provides preliminary evidence that encouraging the use of symbolic gestures in low-income families is associated with more positive perceptions of children and more attunement and responsiveness in parent-child interactions (Vallotton, 2012).

Babies Open Our Minds to Their Minds

This article discusses the research that indicates that signing can benefit students of all ages (Vallotton, 2009). Signing can be used to enhance education for learners of a wide range of ages and abilities (Vallotton, 2009). Sign promotes development so extensively to the point that it is recommended even for kids with a speech delay (Vallotton, 2009). Research findings show that signing has an impact on infants' language development, cognitive development, and social-emotional development (Vallotton, 2009). Vallotton (2009) also addressed common asked questions regarding infant sign with research-based answers. When asked when a parent should start teaching sign, Vallotton (2009) suggests that children who are introduced to signs when they are about two years old tend to learn them more quickly, but infants who are introduced to signs immediately do learn them and use them at a young age, before they develop verbal cues. Vallotton (2009) argues that infant sign does not impede verbal development.

Augmentative and Alternative Communication (AAC) includes the use of manual signs (DeThorne, Johnson, Walder & Smith-Mahurin, 2009). Although counterintuitive to many, AAC devices can serve as a critical tool in facilitating speech development (DeThorne et al., 2009). There is evidence that the potential importance of providing verbal models in conjunction with sign if the ultimate goal is to facilitate speech production (DeThorne et al., 2009). DeThorne and colleges (2009) suggest rather convincingly that AAC not only provides a compensatory mechanism for speech difficulties but can also serve as a powerful tool in facilitating natural speech development.

In conclusion, there is strong evidence for many benefits of using signs and sign language with children of many ages (Vallotton, 2009). However, there are also still many questions about

the use of signs with children that are hearing that have not yet been answered by experimental research (Vallotton, 2009). As reviewed above; research has shown that signs allow preverbal children to express their emotions and communicate with their caregivers (Vallotton, 2009). Research has also shown that children use signs in the process of regulating their own behavior (Vallotton, 2009). However, there has not yet been an experimental study conducted that determines whether signs increase children's socio-emotional skills (Vallotton, 2009). Finally, there has not yet been a study conducted that specifically examines the effects of using signs with language delays or disorders (Vallotton, 2009).

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