Listening to Preverbal Children:
Symbolic Gestures as an Intervention to Enhance the Caregiver-Child Relationship

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ABSTRACT

How would our interactions with infants and toddlers be different if they could clearly and explicitly express their feelings, thoughts, and desires to us? What would an infant's separations from her parents be like? How would conflict between toddlers be handled? What kind of changes would we make in the subtle ways we respond to young children? Since the discovery that preverbal children can use symbolic gestures, the UC Davis Center for Child and Family Studies (CCFS) has been using Baby Signs® as part of their infant/toddler program and the curriculum for child development student caregivers. Other parent education and infant development programs have begun to use signs as well. Two applied studies examined the effects of this intervention on caregiver-child interaction. Study one describes change in the responsiveness of non-parent caregivers (at a university lab-school) in daily interactions with the children in their care. Study two, an applied experimental design, describes change in several aspects of the parent-child relationship in Early Head Start parents and their children, including (a) changes in parents' stress related to their children, and b) changes in parent responsiveness to children's affect and communicative signals. Results show that the use of sign language with preverbal children encourages caregivers to pay closer attention to infants' cues, provides children with a tool to actively participate in their own care, and changes the way caregivers think and feel about children.

INTRODUCTION

This paper describes the use and effects of the use of symbolic gestures – or simple sign language – with normally-hearing preverbal children. Use of sign language allows preverbal children to communicate more clearly with adults (Acredolo & Goodwyn, 1992), even about feelings and emotions (Vallotton & Grinbaum, 2004). The use of sign language with preverbal children is becoming more popular in child care and private homes. Since the seminal studies on preverbal children's ability to use – and in fact *invent* – symbolic gestures (Acredolo & Goodwyn, 1988), a handful of child care and development programs have begun using the Baby Signs® Program (systematic use of simple symbolic gestures with preverbal children) as a curriculum or intervention aiming to enhance caregiver-child interactions. The UC CCFS has been using symbolic gestures as part of the curriculum for their child development students and caregivers for the past 15 years. And several Early Head Start programs (center-based and home-visiting) have begun to use Baby Signs® as a parent-child educational intervention.

Two applied studies examined the effects of using the Baby Signs® Program (system of simple sign language) as a caregiver-child intervention: (1) a qualitative study of the responsiveness and attitudes of non-parent caregivers in daily interactions with the children in their care, and (2) an applied experimental design testing the effect of signing with young children as a way to change the parent-child relationship in Early Head Start families.

STUDY 1: CHILD CARE SETTING

QUESTIONS

- How can a sign-language for babies be effectively taught to caregivers and children?
- How does signing change caregiver-child interactions?

CAREGIVER EDUCATION CURRICULUM

Symbolic gestures – better known as Baby Signs® – are used in the infant & toddler classrooms at the University of California, Davis' Center for Child and Family Studies (CCFS) in order to (a) teach caregivers to watch for children's subtle cues, and (b) give children another tool to interact with their environment. It provides a common language between infants and adults. The use of the gestures is taught to caregivers, reinforced with posters in the classrooms, modeling by the head teacher, and eventually with feedback from the children themselves. Children are never instructed on gesturing, but learn through caregiver modeling.

RESEARCH METHODS

Participants

Participants were 10 infants (3 males) who were enrolled in the Infant Classroom at the UC Davis CCFS; infants were between 4.5 to 11.5 months of age at the beginning of the study. Participants also included 25 student caregivers (2 males) enrolled as child development students at UC Davis. For their minimum 3 month duration in the classroom, caregivers were assigned to the same two infants each day. Caregivers had the option to continue their participation in the classroom for up to 9 months.

Measures

Caregivers' observations of children. As part of their child development education, student caregivers made written observations of the children each week. These transcripts provide detailed information about specific moments between caregivers and children, and provide insight into both how caregivers behave toward children and how they think about them.

Coding of caregiver and child behavior. Child-caregiver interactions were videotaped during the daily classroom routines of free play and snack time. Each caregiver was filmed a minimum of 12 times over the course of 3 months; each videotaped interaction was 5 minutes in length. Videotapes were coded for the following:

- All symbolic gestures used by a child or caregiver during interactions were coded in real time, including the content and conversational context of the gesture.

- Caregiver sensitivity and responsiveness to children on 18 different specific behaviors consistent with the philosophy of the CCFS was scored by a team of observers. Scores are averaged across the 18 behaviors.

RESULTS

Use of Signs

- Caregivers used a total of 78 different signs between them.
- Infants used a subset of 36 different signs between them.

Caregiver Sensitivity and Responsiveness

Caregivers were more sensitive and responsive to children during interactions in which the caregivers used more gestures; child gesture use did not appear to impact caregiver sensitivity and responsiveness.

> "I pay more attention to them [the infants] when I expect them to sign; I think I watch more closely. I want to know what they're going to say." ~ Infant classroom caregiver at the UC Davis Center for Child and Family Studies.

Table 1
Correlations between Caregiver Sensitivity and Use of Gestures controlling for Caregiver's Time in the Program; N = 182 Episodes

Caregiver Symbolic Gestures	.2032*
	.003
Caregiver Pointing	.1279*
	.042
Child Symbolic Gestures	-.0494
	.253
Child Pointing	.0555
	.227

Caregiver-Child Interactions Using Signs

Examining the observations written by caregivers (see Table 2) shows how signs are used in caregiver-child interactions. Children use signs to express needs and desires, initiate interactions, and describe their own observations of the world. Caregivers use signs to communicate clearly with children, and to elicit responses from children.

> "Using sign language in the classroom boosted my caregivers' sense of professionalism and their moral." ~ Early Head Start Director

Table 2
UC Davis CCFS caregivers' observations of children's use of symbolic gestures

Title	Observation (in Caregivers' written words)
Waiting to go outside	*Carlie (female, 11.3 months) was standing directly in front of the door with her face a couple feet away from it. Both hands were widely spread apart and pressed on the door. Carlie lifted her left hand up while her right hand was still pressed on the door. With her left hand bending in a shape of a claw she turn it back and forth, gesturing outside. "I know you want to go outside, Carlie, but Shirly [other caregiver] is still changing David's diaper," I said as I patted my hip to gesture "diaper." "Carlie, can you waited until Shirly is all done with David?" I asked with my right fist closed to tap on my open left hand to gesture wait. Then with both hands I swayed it back and forth to gesture "all done." Carlie looked at me, her mouth pressed together and nodded.*
Andy hears the telephone	*Andy (male, 13.9 months) sat on the stairs near the books; I sat a few feet away. The phone rang; he looked up at me and raised his eyebrows. He opened his mouth very wide; I imitated his face right back to him. As Livna [Head Teacher] answered the phone, he looked up at her, then glanced back at me. He immediately brought his fist to his ear. I laughed, a little surprised, and said, "That's right, you heard the telephone," and I smiled at him. He took his fist down from his ear and smiled widely.*
Making a Comparison	*Esther (female, 15.1 months) and I were sitting by the manipulatives shelf below the diaper changing tables. She pointed to the picture of the cow and made the gesture for cow while looking at the picture. I mirrored her gesture and said, "Yes, that is a cow." Esther smiled and walked over to the quiet area and brought back a stuffed cow. She again made the gesture for cow and then pointed at the cow picture. I said, "They are both cows. You're right."*
The big dog	*Emilia (female, 15.8 months) starred at the big dog with her eyebrows slanted inward. She gestured "dog" and pointed at the dog. Her caregiver said, "Yes, it's a big dog." Emilia took a couple of steps forward and stopped. She gestured "dog" and "scared." Her caregiver said, "The dog scares you? It's OK, this dog is gentle," and she stroked the dog. Emilia continued to stare at the dog. Her caregiver continued stroking the dog and saying, "Gentle." Emilia walked slowly to the dog and poked it with her index finger. She waited, and poked it again. She waited and tapped the dog twice. She waited again and tapped the dog. She waited and gave the dog a hug.*

Table 2
UC Davis CCFS caregivers' observations of children's use of symbolic gestures

Title	Observation (in Caregivers' written words)
Missing mom at diaper changing time	*After I laid Alana (female, 15.8 months) down on the diaper table she began to make a whimpering sound. I said to her, "Alana, I am going to change your diaper." She looked at me with a frown on her face and gestured "Mom." I said to her, "Alana, I see that you are thinking about your Mom. Mom will be here at pops. I am going to change your diaper right now. Then we will go outside and play, and then Mom will be here at pops." While I changed her diaper I talked to her, explaining what I was doing step by step. She looked at me and gestured "stars." So I began singing Twinkle, Twinkle and when her diaper change was done she immediately put her hands out so that I could pick her up*
Reading and gesturing	*Tobin (male, 19.8 months) walked towards me with a book in his hand. I asked him, "Would you like me to read the book with you?" He nodded. I took the book from his hand as he sat on my lap. I opened the book and saw two ducks on the first page. I gestured duck and asked, "Tobin, do you see the ducks?" He responded by gesturing duck. Tobin flipped the pages; we saw a frog. I gestured frog. Tobin continued to flip the pages. I saw a fish and gestured fish. Tobin also gestured fish and smiled.*

STUDY 2: PARENT-CHILD INTERVENTION

QUESTIONS

- How can sign language for babies be easily and effectively taught to parents and children?
- How does signing change mother-child interactions?

PARENT EDUCATION THROUGH HOME-VISITING

Symbolic gestures were implemented in the Home-Visiting component of an Early Head Start program for families already enrolled in EHS. The intervention design was intentionally simple so that it could be easily replicated. Parents were offered materials on use of signs alone, with no additional child development information embedded within the curriculum so that any effects of the intervention could be attributed to use of signs. Each family in the signing-group received the following:

- One-time demonstration of signing during home-visit
- 2-page summary on use of the Baby Signs® Program
- Set of 10 illustrated refrigerator magnets showing signs
- Signing storybook, with original 10 signs plus 7 more
- Children were not taught directly but learned through parent modeling

RESEARCH METHODS

Participants

Twenty nine (29) preverbal children (17 males) and their mothers who were enrolled in Early Head Start program were randomly assigned to a Baby Signs® Curriculum group (16 families) or a control group (13 families). There were no significant group differences before intervention.

Measures

Sign Use Interviews. At 3 and 7 months after the beginning of the intervention, I administered the Gesture Use Interview to mothers in both the signing and comparison groups. The interview assessed the number of unique signs used by child and mother, the daily frequency of signing, the number of routines in which signs were used, and the number of different people using signs with the child. Mothers had to spontaneously recall and show each gesture during the interviews.

Mother-Child Interaction. Children and mothers from both groups were videotaped in semi-structured play tasks before and 7 months after the beginning of the intervention. Mother-child interactions were coded sequentially in real time for each of the following behavior sets:

- Child's and mothers' affects, including affect synchrony and mother's responsiveness to child's affect
- Child's communicative cues – including social, request, and distress cues – and mothers' responses to each cue.

Mothers' Stress and Perceptions of the Child

Mothers completed the Parenting Stress Index (PSI) before and 7 months after the beginning of the intervention. The two child-related subscales I thought would be most likely to change as a result of this intervention were mothers' acceptance of the child (Acceptability Scale) and her feeling of reinforcement from the child (Reinforces Parent Scale). Thus, though parents completed the entire PSI, only these subscales were used in analyses.

RESULTS

Use of Signs

Though 3 families in the sign group did not sign, and 5 families in the control group did some signing, there were significant differences between groups.

- Signing group: children used an average of 6.8 signs, mothers used an average of 6.0 signs.

- Control group: children used an average of 1.9 signs, mothers used an average of 1.8 signs.

Responsiveness to Children's Cues

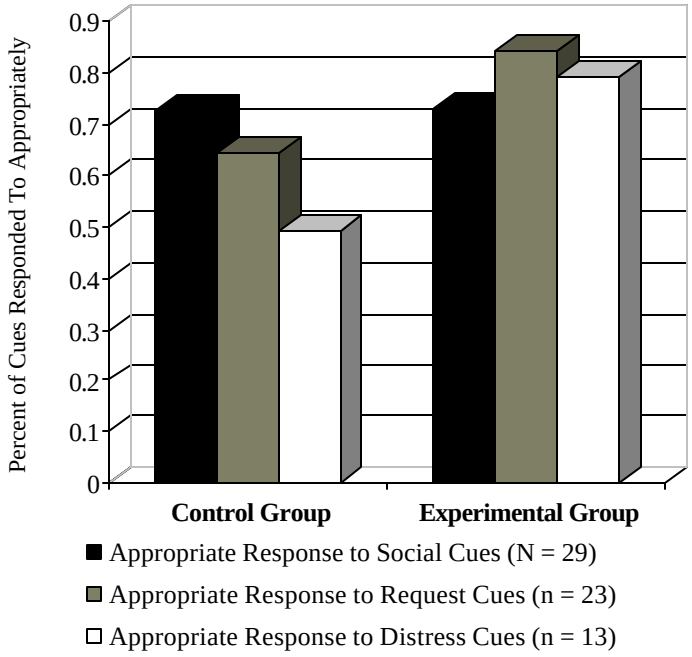
Mothers who used signs with their children were more likely to respond appropriately to children's overall cues, particularly to their distress cues. While the use of symbolic gestures did not have an effect on mothers' responses to children's social cues, it did appear to have an effect on the percent of children's distress and request cues that received an appropriate response from mother, as seen in 1. Moreover, in the total sample, mother's gesture use was positively correlated with her percent of appropriate responses to distress cues at Time Two (r = .505, n = 13[1], p = .039, one-tailed), whereas appropriate response to distress at Time One was not significantly correlated with subsequent gesture use.

> "I know what she [infant daughter] wants now because she can tell me." ~ Early Head Start Mother

Response to Affect

Sign use was significantly related to mother's affect responsiveness (r = .413, p = .014, n = 28), that is, the percentage of changes in children's affect which were responded to be a change in the same direction by the mother.

Figure 1. Mothers' responsiveness to children's cues in the Experiment (signing) and Control Groups after Intervention Period.



Parenting Stress

Mothers in the signing group had less stress in the PSI Reinforces Parent subscale which measures mother's satisfaction with the relationship (F (1, 23) = 5.981, p =.023). Further, in the total sample, signing was related to reduction in stress in both the Reinforces Parent (r = -0.352, p < .05) and Child Acceptability (r = -0.361, p < .05) scales.

> "Bedtime used to be our biggest struggle every day. She [toddler daughter] would whine and cry, but would not go to bed. Now she signs "sleepy" and starts the bedtime routine herself." ~ Early Head Start Mother.

DISCUSSION

Results show that the use of sign language with preverbal children encourages caregivers to pay closer attention to infants' communicative signals, provides children with a tool to actively participate in their own care, and changes the way caregivers think and feel. Mothers and caregivers were more sensitive and responsive to infants during interactions in which the adult used signs. Children's use of signs affected caregivers' perceptions of children. Mothers' reported less child-stress related, while child care staff reported expecting more intentional behavior and communication cues from infants. Interactions between children and adults using signs were more fluid and reciprocal. Children use signs to initiate and direct activities with both mothers and non-parent caregivers. The use of the Baby Signs® Program as a child-caregiver intervention has positive effects on adult-child relationships – both daily transactions

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[1] The number of data points is low in this analysis because not all children displayed distress cues.