

Signs of Emotion: What Can Preverbal Children “Say” About Internal States?

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ABSTRACT

What do preverbal children know about emotions, about the internal states of themselves and others? This study examines the use of symbolic gestures by normally-hearing preverbal children to discover whether young children’s symbolic gestures of emotion and feeling concepts are in fact meaningful representations. By coding and transcribing gesturing behavior within social context of 22 children and their caregivers, this study confirms that preverbal children’s emotion gestures are not just imitations of adult gestures, and finds evidence that children perform emotion and feeling gestures in socially appropriate contexts.

INTRODUCTION

What do infants and toddlers know about emotions, about the internal states of themselves and others? Young children learn about the social and emotional world within an amazingly short period of time, however investigation of infants’ emotional understanding is limited by the challenge of understanding infant cognition and emotion before the onset of speech. Children’s use of symbolic gestures prior to speech offers a method of breaking the language barrier to study children’s social-emotional skills and knowledge at earlier ages. With symbolic gestures we can ask, Can children represent feelings and emotions? What would infants say about internal states if they had the words?

Typically developing children begin to express emotion (i.e., sad, happy) and feelings (i.e., sleepy) concepts shortly after the onset of verbal language, with most children acquiring the use of internal state language around 2 years of age (Bretherton & Beehly, 1982). Though research reveals that children can understand spoken language before they can vocalize the words, children are not generally believed to reflect on or have an abstract understanding of the emotions of themselves and others until they are verbal.

Although we can learn much through infants’ behavioral responses to emotion stimuli, such as those seen in habituation (e.g. Barrera & Mauerer, 1981) and visual cliff studies (e.g. Nelson, 1987), studies of preverbal children have not included investigations of infants’ explicit awareness of or reflection on different feelings and emotion states. Failure to see these skills at younger ages may be because child development scientists rely on children’s ability to vocalize their understanding of emotion concepts in order to study this understanding, and assume that their ability to use these concepts effectively in emotional situations develops only after children can voice their feelings. But what could be learned about preverbal infants’ knowledge of emotions if they could express what they know in a way that adults could understand? Children are capable of using symbols (in the form of symbolic gestures) long before they can speak, leading to the question: If preverbal children can use symbols to communicate observations and desires, can they use symbols to explicitly articulate emotion concepts? If they do use signs for emotions and feelings, how do we know that they are really meaningful?

Prior studies have shown that preverbal children are capable of using symbols (in the form of symbolic gestures) long before they can speak to make requests and share observations (Acredolo & Goodwyn, 1988, 1992), and that they use gestures related to emotion, feeling, and time concepts (Vallotton & Grinbaum, 2004). This study examines the use of symbolic gestures by normally-hearing preverbal children to discover whether young children’s symbolic gestures of emotion and feeling concepts – such as *sad*, *scared*, and *sleepy* – are in fact meaningful representations. Are they simply imitations of adult gestures? Or are they performed independently in appropriate contexts?

METHODS

Participants

Participants were 10 infants (7 females) and 12 toddlers (5 females) in classrooms where the use of symbolic gesturing is modeled by caregivers. Infants were 4.5 to 11.5 months old when the study began. Toddlers were 17.3 to 24.8 months of age when the study began.

Program Procedure

Children were never explicitly taught or directed to use gestures, but learned and used the gestures which were modeled by caregivers in conjunction with speech during normally occurring interactions with the children. In addition, children occasionally invented new gestures themselves, which, if understood by the caregivers, would then be used by the caregivers in interactions with the children. Caregivers modeled a total of 78 different symbolic gestures including feelings corresponding to the words *hurt*, *cold*, *loud*, *gentle*, and *sleepy*, emotion/feeling state gestures for *sad*, *angry*, *scared*, and *happy*, and gestures corresponding to time-related words *wait*, *later*, and *pops* (popsicle time, when parents returned for their children). Time concepts are included because they are emotionally salient, as in the reunion with parents at popsicle time. A list and descriptions of all of the symbolic gestures observed in the Infant and Toddler Program during the study period is available from the author.

Video-Taping Procedures

Children were systematically videotaped during normal program routines at the Center for Child and Family Studies. Videotapers were in the classrooms and playgrounds with the children and could move to follow the children as necessary. Infants were studied for 8 months, while toddlers were studied for 3.5 months. Initial video tape data on infants and toddlers were gathered separately for two different studies on symbolic gesture use, thus the methods of initial data collection are not equivalent, though

coding of symbolic gestures from the videotapes is consistent. The two sets of data are presented together in this paper because they provide complimentary information; however, analyses of the two groups are done separately, and they are not compared statistically. Each infant was videotaped an average of 35 times while with a caregiver, for five-minute periods, over the course of 8 months. Half of the videotapes of each infant-caregiver dyad were taken during snack-time and half were taken during free-play times. Toddlers were videotaped an average of 15 times each over the course of 3.5 months. Toddlers were videotaped during regularly-occurring distressing routines (separation from parents, diaper changes, and conflict between children). Videotapers were instructed to shadow each child and began filming before the anticipated distressing event (except in the rare case of spontaneously occurring conflict) and continued recording until the child had resumed normal play. Videotape lengths ranged from 0.5 to 19 minutes ($m = 5.5$ min).

Coding and Transcribing Procedures

Coding for content and conversational context. To discover whether children's gestures were just imitations of adults, gesture use by children and caregivers was coded to determine both the content (the concept represented) and conversational characteristics. Each gesture was coded as having one of four mutually exclusive conversational contexts: imitation of another's gesture (performing same gesture another did within 5 seconds), response to another's gesture (performing a different gesture than another in response to the other's within 5 seconds), initiation of a new gesturing sequence (no other gesture occurred within the last 6 seconds), or continuation of one's own gesturing sequence (within 5 seconds).

Coders' agreement on both type (which gestures were being used) and initiation of gestures was assessed concurrently; that is, they had to agree on both which gesture was done, and whether the infant had initiated or imitated an adult, in order for codes to be considered in agreement. Coders of infant data achieved inter-rater reliability scores of Kappa = .75 or above on five tapes in a row before coding independently, and upon reassessment had Kappa scores of .83 and above.

Transcribing for social context. To investigate whether children's emotion and feeling gestures were meaningful in their social context, videotapes were transcribed for children's and caregivers' vocalizations, gestures, affect, and concurrent salient social events (such as another child crying, or a mother leaving the room). Based on coders' interpretations of social events and of children's communicative intents, episodes that included emotion or feeling gestures were coded as representing a) own internal state, b) the internal state of another, or c) as having insufficient information to determine social meaning.

RESULTS

Do infants use emotion, feeling, and time gestures?

Of the 20 children observed to use symbolic gestures, nine children used either an emotion gesture or feeling gesture or both; six children used emotion gestures, the earliest recorded on videotape at 10.9 months of age, and five used feelings gestures, the earliest recorded at 14.7 months of age. Additionally, 11 children used time-related gestures, the earliest at 12.8 months of age (see Table 1).

Are infants' emotion & feeling gestures just imitations?

Chi-Square and Binomial tests confirmed that most gestures – including emotion, feeling, and time gestures – were not imitations of adult gestures (see Table 2); in fact, infants initiated most gestures in each category, rather than imitating an adult. In the feeling, emotion, and question categories, all of infants' gestures were initiated rather than replies to adults; that is, they were separated from the last adult gesture by at least 6 seconds, and in most cases, the separation was more than 10 seconds. As might be expected, the most common category of gestures to be replies to an adult were those that were natural replies to questions: *yes* and *no*.

Table 1

Number of children using emotion, feeling, and time gestures

	<i>Gesture</i>	<i>Number of Children Using Gesture</i>		<i>Earliest Age (in Months) of Observed Use</i>
		<i>Total</i>	<i>Infants/Toddlers</i>	
<i>Emotion</i>	<i>Happy</i>	1	1 Infant, 0 Toddlers	12.9
	<i>Mad*</i>	0*	0 Infants*, 0 Toddlers	*9.0
	<i>Sad</i>	6	3 Infants, 3 Toddlers	10.9
	<i>Scared</i>	2	2 Infants, 0 Toddlers	11.1
<i>Feeling</i>	<i>Sleepy</i>	1	1 Infant, 0 Toddlers	14.7
	<i>Cold</i>	4	0 Infants, 4 Toddlers	18.7
	<i>Gentle</i>	1	0 Infants, 1 Toddler	19.2
	<i>Hurt</i>	2	1 Infant, 1 Toddler	16.7
	<i>Loud</i>	1	1 Infant, 0 Toddlers	17.5
<i>Time</i>	<i>Pops</i>	9	4 Infants, 5 Toddlers	12.8
	<i>Wait</i>	3	1 Infant, 2 Toddlers	17.2
	<i>Later</i>	5	1 Infant, 4 Toddlers	15.2

* Though the mad gesture did not appear in our quantitative data, infants' use of the mad gesture has appeared in systematically collected transcripts of child behavior in the classroom.

Table 2

Gesture category by child conversational context category

Gesture Category	Child Initiation Category	Observed N	Expected N	Residual	Chi-Square test of differences between Initiation Categories	
Non-Symbolic	Child Initiated	260	94.0	166.0	Chi-Square	439.745
	Child Replied	10	94.0	-84.0	<i>df</i>	2
	Child Imitated	12	94.0	-82.0	Asymp. Sig.	$p < .001$
	Total	282				
Time	Child Initiated	9	5.0	4.0	Chi-Square	6.400
	Child Replied	1	5.0	-4.0	<i>df</i>	1
	Total	10			Asymp. Sig.	$p < .02$
Emotion	Child Initiated	10	2.5	.0	Binomial	
	Other Categories	0	7.5	--	Observed	1.00
	Total	10			Sig, 1-tailed	$p < .001$
Feeling	Child Initiated	4	1	.0	Binomial	
	Other Categories	0	3	--	Observed	1.00
	Total	4			Sig, 1-tailed	$p < .01$

Are gestures meaningful within a social context? Thirty seven (37) of the transcribed gesturing episodes (across 9 children included a child using emotion or feeling gestures; this did not include those episodes that contained emotional content (i.e. mom leaving or returning) without an emotion or feeling gesture. Based on the transcription of the child's behavior, caregivers' behavior, and salient events in these episodes (see Table 3 for examples), it was possible to discern whether a child was representing her own internal state or the internal state of another for 26 of the 37 episodes (see Table 4).

Table 3

Transcribed observations of children communicating emotion concepts through symbolic gestures

NOTE: Names of children have been changed, but ages are accurate.

Category/ Interpretation	Transcription
1. Reflecting on own internal state in past experiences.	Cathy (11.1 months) picked up a small spider stuffed animal on the floor and looked at it for a while. She looked at her caregiver and said, "Me!" "Yeah, you are holding a spider, Cathy," her caregiver said. Cathy looked at the spider with her fist pounding on her chest (the gesture for scared). Then, she looked back at the caregiver. "It seems that you are telling me that you are scared of the spider," the caregiver said. Cathy nodded without a smile.
2. Expressing own current internal state.	Alana (15.3 months) was lying on the changing table and made the gesture for sleepy/nap . Her caregiver asked if she was tired; then Alana repeated the sleepy/nap gesture. Another child's caregiver was setting up a diaper table nearby and oversaw Alana make the gesture for nap. The second caregiver asked, "Are you tired, Alana? It's Monday, and I'm always tired on Mondays. Are you tired on Mondays?" Alana smiled and said, "Me?" in the tone of a question while pointing to herself . The second caregiver said, "Yes, that's right. You're pointing to yourself and saying, 'Me.'" Alana smiled and repeated "Me," and pointed to herself , followed again by the gesture for sleepy/nap .
3. Reflecting on cause or coping for the emotions of another.	Ellie (15.5 m) stopped as she was walking across the room, and made the gesture for hear . Her caregiver commented that she heard Billy crying. Ellie then made the gesture for sad . The caregiver said, "Yes, Ellie, I think Billy is sad. Emily is going to hold him and make him feel better." Ellie looked at her caregiver and made the signs for bottle and sleepy/nap . The caregiver said, "I think you are right. Maybe Billy needs a bottle and a nap," while repeating the gestures. Ellie looked at the caregiver and pointed at Billy, as she again gestured sad , bottle , and sleepy/nap directly following one another.

Table 4

Number of episodes in which each child used symbolic gestures to describe internal states of self and other

Child ID	Emotion Word Episodes			Feeling Word Episodes		
	About Self	About Other	Can't Tell	About Self	About Other	Can't Tell
Infant I-3	1	-	2	-	-	-
Infant I-9	-	-	1	-	-	-
Infant I-10	4	3	4	2	-	-
Toddler T-1	-	-	-	1	-	-
Toddler T-3	-	-	-	6	-	2
Toddler T-4	-	-	-	1	-	-
Toddler T-7	-	3	-	-	-	-
Toddler T-9	1	-	-	1	1	2
Toddler T-12	2	-	-	-	-	-

DISCUSSION

Results reveal sophistication in infants' understanding of the social world, including their own and others' internal states. Infants spontaneously represent emotion, feeling, and time concepts in socially appropriate context.

Therapeutic implications.

There are three ways that I can see the use of symbolic gestures benefiting the social-emotional development of preverbal children. Each of these benefits could potentially be achieved within the context of either a parent-child or a non-parental caregiver-child relationship.

Expressing emotions. The systematic use of symbolic gestures with preverbal children can be used to encourage expression of the children's own emotions, in both positive and challenging circumstances, as seen in Observation 1 in Table 3. There is an increasing recognition of the need to help young children express their feelings through words. Programs such as Early Head Start and NAEYC-accredited childcare classrooms include expression of emotions as part of their curriculum standards. However, these curricula and practices are typically developed only for verbal children. Thus, the use of symbolic gestures in a childcare classroom and at home could be integral to Infant Mental Health focused curricula for our youngest children in care.

Conversing about emotions. Use of emotion gestures creates opportunities for children and their caregivers to discuss emotions of self and others. It is common of many parents, and possibly other caregivers, to avoid talking about negative emotions with their very young children. Symbolic gestures can be used to facilitate "conversations" between caregivers and children about the nature of emotions as demonstrated in Observation 3 in Table 3, and allow children to initiate conversations about emotion or at least elicit an explanation from a caregiver.

Constructing an understanding of emotions and internal states. Children build their knowledge of the world actively – observing, categorizing, naming, and eventually explaining and making meaning of what they experience. Vygotsky (1934/1986) proposes that words, or symbols, are mental tools for constructing knowledge. Within this framework, the use of emotion gestures is not just expression of one's own emotions, but may be the beginnings of a process by which preverbal children build an internal vocabulary of emotion and feeling.

If it is true that symbols help us construct our understanding, then we may find that children who have the use of emotion gestures might show advanced coping and social interaction skills. Certainly gestures provide a problem-focused coping tool to the child because she is able to more easily and actively communicate her needs to a caregiver, but might they also help her construct an understanding of emotions and other internal states, providing an emotion-focused coping tool as well? The use of symbolic gestures as both an intervention and a research methodology could begin to answer these questions.

Conclusion.

In summary, the current study provides a confirmation of preverbal children's ability to use symbolic gestures to represent emotion and feeling concepts, showing that they are meaningful representations in socially appropriate contexts. These results reveal further the sophistication of the infants understanding of the social world and their emotional experiences, and show that symbolic gestures may be used to promote conversations about emotions between caregivers and children.

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ACKNOWLEDGEMENTS

The author would like to thank the children, parents, and staff of the Center for Child and Family Studies at UC Davis for their time and patience in the studies involved in this report, as well as the dedicated research assistants who so competently collected, coded, and transcribed data, and without whom this study would have been impossible. The author would also like to thank the Eichhorn Family Foundation for their generous gift to continue and communicate this work to others. And finally, friend and colleague, Livna Grinbaum, for the use her valuable data on toddlers' symbolic gesture use.