Infants Take Self-Regulation Into Their Own Hands

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Ten-month-old Celia watched her papa make a fire in the woodstove in their living room. Sitting several feet behind him, she watched him crinkle the paper and stack the logs into the stove. The long, bright red lighter lay next to him on the floor. She crawled toward it.

From the time she was 6 months old, Celia's mama and papa had been teaching her that the woodstove in the living room was "hot." They used the word repeatedly and paired the word with a gesture: extending one open palm toward, but not touching, the hot object. Celia had begun using this sign when she was 8 months old and used it to describe many different hot objects, including the lighter, showing that she understood the concept "hot."

Papa watched out of the corner of his eye as Celia reached toward the lighter, then shook her head and said "No," and then retracted her hand without touching it. She repeated this series of actions again and again: reaching toward the lighter, saying "No" and shaking her head, then retracting her hand. Though very tempted by the bright, fascinating object, Celia successfully prohibited her own inclination by using symbols—both language and gesture—to tell herself not to touch the hot object.

In this story, recounted to me by Celia's father, Celia inhibited an action she wanted to do but that she associated with a danger prohibited by her parents, demonstrating her growing ability to regulate her own behavior in compliance with her parents' expectations. Although she was just beginning to use her first words, Celia also demonstrated the relationship between language and self-regulation. Further, her use of gestures points to the possibility that both gestures and words may be used by young children as mental tools for self-regulation.

For older children and adults, language serves as a mental tool set for self-regulation: It allows us to reflect on, monitor, and modify our own behavior. Recall your own self-regulatory response to frustration; it most likely includes talking to yourself, possibly even out loud. Children as young as 3 talk out loud to themselves to regulate their behavior in challenging situations, using private speech as self-regulatory self-talk (Winsler, De León, & Wallace, 2003). By 4½ years, children are aware of their own use of private speech as a coping tool (Manfra & Winsler, 2006). But the abilities to communicate and to mentally represent concepts—the two main functions of language—both begin prior to the onset of spoken language. Preverbal children can even use infant signs to symbolically represent referents in their absence (Acredolo & Goodwyn, 1985). Can preverbal children also use infant signs as a form of self-talk for the purpose of self-regulation?

Language as a Psychological Tool Set for Self-Regulation

Learning to inhibit a first impulse—whether it is to reach toward a familiar resting place for an object no longer there, use aggressive behavior to get what we want, or give up on a difficult task—allows us to solve complex problems, accomplish our goals, and get along with others. Though self-regulation involves a complex set of skills spanning all developmental domains, self-inhibition is a building block in the foundation of this critical ability. How does this ability to change the course of our own behavior develop?

Russian psychologist Lev Vygotsky was one of the greatest contributors to our theories and understanding of the relationships between social interactions, language, and thought. He acknowledged that the basis of human behavior lies in the reflexes and impulses demonstrated by very young children in reaction to events, desires, or feelings, and he proposed that development involves learning to bring our higher mental processes to bear on these reflexive reactions (Vygotsky, 1934/1986). Further, Vygotsky (1934/1986) believed that symbols—most commonly, but not always, words—are the mental tools we use for monitoring and manipulating our own behavior.

In his studies, Vygotsky described the development of self-regulatory self-talk beginning around 3 years old (Wertsch, 1979). Through participation in regulatory interactions, children internalize the regulatory speech of their caregivers. At first, a caregiver (a parent, other adult, or more advanced peer)

Abstract

Language serves as a mental tool set for self-regulation, allowing us to reflect on and modify our own behavior. Children as young as 3 talk out loud to themselves to regulate their behavior, using self-regulatory self-talk. Can preverbal children use infant signs as self-talk for the purpose of self-regulation? The author shares observations from a child development center using the Baby Signs® Program. Infants and toddlers use signs to request comfort in regulatory interactions with caregivers, and they use signs when alone to modify their own behavior in emotionally challenging situations. Infant signs provide infants with the cognitive tools to participate actively in their own regulation.

Photo: Rebecca Vallotton

Eight-month-old Celia signs "Hot" from a safe distance.

speaks to the child to keep him focused on the task at hand. If he gets distracted, the caregiver draws his attention back to the task (e.g., "Let's finish this puzzle first before you play"). If he gets frustrated, the caregiver provides reassurance (e.g., "Yes, this is a hard one, but you can do it if you try again"). When he gets stuck and doesn't know how to proceed, the caregiver coaches him (e.g., "The piece didn't fit there; where will you try it next?"). In a sense, the caregiver is acting as an external executive function, monitoring and manipulating the child's inhibition, attention, and strategies. Then the child begins to participate in and take over this role for himself. He begins by talking out loud to himself, using words and phrases parallel to the ones his caregiver used (e.g., "Puzzle first, no play," "Try again," "Not there; where next?"). More and more he serves as his own regulator, though his speech is still out loud, still external. He says to himself the same words his caregiver used, hears those words, and responds to them. As his cognitive skills become more advanced, the young puzzle-solver will no longer say the regulatory phrases out loud, but will mouth them quietly to himself as he goes about his task, often independently of the caregiver. In the final stage of this process, the child maintains focus on the problem without external speech. The caregiver's regulatory speech has been internalized as the child's conscious dialogue of executive function, the psychological tool set the child will use to manipulate his own thoughts, feelings, and behavior. Thus the child's self-regulatory self-talk is a reflection of the speech his caregiver directed toward him, and he has internalized this speech through a process of increasingly active participation in regulatory interactions.

Gestures as Early Symbols Used for Self-Regulation

There are two broad functions of language: communication and representation. However, both communication and representation begin to develop prior to the onset of spoken language. Infants begin intentional communication as early as 6 months of age (Wagner, 2006), and by 10 months most typically developing infants have a repertoire of communicative behaviors, including vocalizations and gestures such as pointing and showing (Crais, Douglas, & Campbell, 2004; Wagner, 2006). By 12 months they are even intentional about using gestures to influence others' mental states (Tomasello, Carpenter, & Liszkowski, 2007).

Most scientists studying infant gesture look primarily at its communicative function. Yet according to Susan Goldin-Meadow (2005) and her colleagues, gestures used along with speech often represent unspoken content of thought. Further, in a series of studies on gesture use by preverbal children and their parents, Linda Acredolo and Susan Goodwyn (1985, 1988) showed that preverbal infants are capable of using truly symbolic gestures; that is, the infants' gestures represent their referents in the absence of the referents (Werner & Kaplan, 1963).

Because gestures can be used as both communication and representation by infants, we may wonder whether gestures could be part of the psychological tool set for self-regulation for preverbal children. Two studies have looked at the self-regulatory function of conventional gestures in young children. One study highlights the use of the head shake as a self-prohibition gesture (Pea, 1980), and the other describes one child's use of pointing and showing gestures to focus her own attention and complete a challenging physical task (Rodriguez & Palacios, 2007).

Roy Pea (1980) documented toddlers' use of the head shake as a self-prohibitive "no" gesture—similar to Celia's head-shaking in my opening story—in his studies on the development of negation in early language. Pea called this use of the head shake *self-prohibition negation*, which he described as "a form of egocentric symbol use in which the child approaches a previously forbidden object or begins to do something which has been prohibited in the past and then expresses a negative" (p. 164). True to the nature of young children's adamant curiosity, these self-prohibitions are not always successful in helping the child avoid the prohibited object (Pea, 1980). In self-prohibition, the child is acting out two roles, both her own role as action-initiator and the role that is usually played by her caregiver, the action-constrainer (Pea, 1980, p. 182). Pea reflected that "The awareness of this contrast [between roles] is most striking when the child actually stops the action as if the parent had been the one to say 'no' rather than the self" (p. 182).

Looking at self-focusing rather than self-prohibition, Rodriguez and Palacios (2007) examined a single child's use of gestures to help herself solve a problem to complete a particularly challenging task. They observed Nerea and her parents in a stacking rings puzzle task when Nerea was 12, 15, and 18 months old. At 18 months, Nerea used private gestures (gestures not directed to either parent) to *think externally* about the problem at hand. In trying to place a ring around a post, Nerea repeatedly showed the ring to herself, turning it over and over, looking for the right position. Further, without looking to the adults in the room, she also pointed repeatedly at the top of the post where she knew she wanted to place the ring. Her mother had done this same pointing behavior minutes earlier to guide Nerea's actions. Eventually she solved the puzzle, placing the ring around the post for the first time without physical help from an adult. When Nerea tried to solve the problem herself, she regulated her own behavior by using the same gestures her parents had used to help her with the task.

Both the self-prohibitive "no" gesture and the use of the self-reflexive pointing and showing gestures for self-focusing reveal that several of Vygotsky's hypotheses about

self-regulatory self-talk in older children are also true of self-regulatory self-*gesture* in younger children. They reveal that even very young children can "think out loud"—in this case using gesture—to direct their own behaviors prior to the internalization of executive thought processes. Further, they show that self-regulatory gestures emerge in the same way that self-regulatory speech does: by internalizing the way caregivers used the same gestures during previous regulatory interactions.

The studies by Pea and by Rodriguez and Palacios examined young children's use of conventional gestures—shaking head, pointing, showing—used by most infants, as well as by adults. But babies who use infant signs are capable of using gestures to symbolically represent and communicate a wide range of their thoughts and feelings (Acredolo & Goodwyn, 1985, 1988, 1992; Vallotton, 2008). Could infants also use infant signs as an early form of self-regulatory self-talk? I sought to answer the following questions on the self-regulatory function of infant signs:

- Does caregivers' use of infant signs help children regulate their emotions or behavior?
- Do children use signs to participate actively with their caregivers in regulating their emotions and behavior?
- Can preverbal children use infant signs in service of self-regulation to change the course of their own behavior?

The Children and Their Signs

The children I describe below were enrolled in the Infant and Toddler Program at the University of California, Davis Center for Child and Family Studies (CCFS). The head teachers and caregivers systematically used infant signs in everyday interactions with the children in what was the original application of the Baby Signs® Program, modeled after the work of Acredolo and Goodwyn (1985, 1988). Caregivers used 70 different signs between them, and children learned a subset of these. The infants and toddlers learned the signs as they do language, picking them up in interactions with adults. They were never explicitly taught or forced to use signs.

The signing stories that I describe below were observed in two ways. Some were captured on videotape, collected, and transcribed for the purposes of research (for complete information on methodology see Vallotton, 2008). Others were reported as part of student caregivers' weekly assignments to write what the CCFS called "anecdotal notes." As part of their training, caregivers were taught to observe and record (in an electronic database) child behavior objectively and in careful detail. In the stories that follow, I distinguish between these two data collection methods by noting in parentheses at the end of each story (V) for video or (A) for anecdotal note. In each story, names have been changed, but age and gender remain accurate.

Caregivers Use Signs to Help Regulate Infant Behavior and Emotion

The first step to internalizing self-regulatory speech is hearing and responding to a caregiver's regulatory speech. In the CCFS classrooms, caregivers use both words and infant signs when they talk with infants about their own and infants behaviors, believing that infant signs may be easier for infants to understand because they are more concretely linked to the concepts they represent.

MELISSA RESPONDS TO A REQUEST TO BE GENTLE

Melissa (11 months) was sitting in my lap near the gate of the snack room, waiting while her caregiver set up her snack. Ruby (another infant) was standing in front of Melissa, holding onto the gate and watching her own caregiver. Melissa was looking at the back of Ruby's head, which was about an arm's length away. Melissa reached out her hand to touch Ruby's hair. I said, "You are looking at Ruby's hair and are wanting to touch it. We need to be gentle." I stroked my arm gently to sign "gentle." She touched Ruby's hair with one index finger, very lightly. I said, "Yes, thank you for being gentle." (A)

Here a caregiver used a sign as part of a regulatory interaction. After her caregiver talked and signed about being gentle, Melissa modified her behavior from a full hand touch to a light, one-finger touch.

TONY IS COMFORTED BY THE IDEA THAT MOM WILL BE BACK LATER

Tony (13½ months) sat next to me as his mom walked out the classroom door. When she was gone, he turned and looked at me with wide eyes, stood up, and ran toward the door. He pressed his hands against the door, opening and closing his fists as he watched out the window in the door. I crawled over and sat beside him. He whimpered a little bit, with the same wide-eyed look. I said, "I know, I saw your mommy leave. It's hard sometimes when Mommy leaves, huh? She'll be back later," and I showed him the gesture for "later." He stared into my eyes the entire time I talked, except when I did the gesture, at which point he looked down at my hands. When I finished talking, Tony smiled at me, turned away from the door, and ran into the classroom toward the toy shelves. He stopped after a few steps and looked back at me, and I began crawling behind him to where he was going. (A)

Photo: Baby Signs, Inc.

The "Gentle" sign. Illustration courtesy of Baby Signs, Inc.

In this story Tony attended to his caregivers' words and signs as she tried to comfort him. He seemed to be comforted by knowing his mother would return later.

Using Signs to Request Comfort From Caregivers

In the CCFS classrooms, children and caregivers co-establish comforting routines, including songs, games, looking at the fish tank, reading a favorite book, or looking out the window. Caregivers use signs in these routines, then children can initiate or modify the routines when they are upset and need comfort.

ANDREW LEARNS TO INITIATE A COMFORTING SONG

Background: Paper stars hang above the diapering table. Caregivers often blow on the stars to make them move while they are changing a baby's diapers. They often sing songs, including "Twinkle, Twinkle, Little Star," to comfort or amuse the children while changing them.

November 11. I put Andrew (11 months) down on the diaper table, and I said, "While I am changing your diaper, we can sing some songs." While I was unbuttoning his pants, Andrew stared up at the stars for a few seconds. I said, "It looks like you are looking at the stars. . . . Twinkle, twinkle, little star. . . ." While I sang, I signed "star." The second time around, Andrew signed "star," bringing his hand up in the air and slowly opening and closing it. After the end of the song, Andrew clapped. (A)

November 18. I laid Andrew down on his back at the diapering table, and he immediately

Photo: Baby Signs, Inc. (©2006)

The "Sad" sign. Illustration courtesy of Baby Signs, Inc.

raised his hands in the air and signed "stars." I said, "That's right. We usually sing about the stars and those are some stars up there." I then gently pushed on the stars. I started to sing, "Twinkle, twinkle,. . ." and Andrew gestured "star" throughout the song. (A)

In the first anecdote, Andrew's caregiver established a comforting routine during diapering in which Andrew participated. In the second anecdote, just one week later, Andrew initiated this routine himself.

HELENE REQUESTS A DIFFERENT SONG

Following snack, I carried Helene (12 months) into the nap room. As I sat down in the rocking chair with Helene in my lap, I started to sing "Twinkle, Twinkle, Little Star." Helene gestured "monkey." So I sang "Monkeys Jumping on the Bed," using the gestures with one hand, repeatedly until her eyelids began to droop. I continued rocking her and let her fall into a deeper sleep before attempting to set her down on the mat. Each time I knelt to lay her down, Helene would awaken and gesture "monkey." I sang the "Monkeys" song each time until her eyelids again drooped. After the third time I was finally able to place her down asleep on her mat. (A)

Helene's caregiver began a routine they typically shared. Helene used a sign to request a modification of that routine, then to initiate it as many times as she needed to fall asleep. Signs provided both Andrew and Helene a way to make specific requests for comfort during what could be emotionally challenging events.

Using Signs in Participatory Regulation

As infants begin to internalize the regulatory speech and gestures of their caregivers, they begin to take more and more active roles in emotion- and behavior-regulating interactions with caregivers. In the CCFS classrooms, caregivers are encouraged to let children find their own solutions to distress and conflict, providing incremental emotional support, just as a sensitive caregiver would provide incremental physical support for a child learning to walk or climb.

CLARA MANAGES SEPARATION BY THINKING ABOUT REUNION TIME

Background: Popsicle Time ("Pops Time") is a daily routine at the CCFS, the time when parents return for the children; children, caregivers, and parents have popsicles together, sing songs, and say good-bye. The stimulating popsicles provide a memory aid for the children, something concrete to remember and look forward to as the time when parents return. The phrase "Pops Time" and the accompanying sign (closed fist tapping chin) become part of most separation routines and a reference used by caregivers when children are missing their parents.

"Bye-bye, bye-bye," said Clara (25 months), waving her hand as she watched her mother walk toward the gate. She turned away and buried her face in my leg. I picked her up and we watched her mom leave. Clara's mouth was sealed tight. Her mom turned around and signed "Pops Time." Clara watched and pointed to the gate in front of her. "Mama's going out the gate," I said, "but she will be back at Pops Time." When her mom was out of sight, Clara put her hand to her chin and gestured "Pops Time." She focused her eyes in the direction where her mother had walked and waved again. (A)

During this separation event, Clara waited until her mother had left, then used a sign for the specific time when Mom would return and waved good-bye again to her absent mother. Clara was not actually gesturing to her mother, but using the signs self-reflexively (to herself), possibly to comfort herself with idea of her mother's return.

GERRY PEACEFULLY RESOLVES A PEER CONFLICT

Gerry, a 21-month-old boy, was playing inside the classroom. Shayna (another toddler) hit Gerry, and Gerry dropped the toy he was playing with, then Shayna took it. Gerry's caregiver, Christy, talked to Gerry about what happened, using signs along with words. "You can tell Shayna to stop when she hurts you," Christy said, showing Gerry the sign for "stop." Gerry responded by nodding "yes" and signing "stop." Christy signed "stop" again, and again Gerry nodded "yes."

Christy reflected on what happened, using the sign for "hurt" and saying, "It looks like that hurt when Shayna hit you." Looking at the child who took his toy, Gerry signed "all done." Christy replied, "We can wait until Shayna is all done," signing "wait, all done." Gerry responded by signing "wait" and "all done."

A minute later, Gerry gestured "wait" again. Christy responded, "You can play with something else while you wait until Shayna is all done," signing "play, wait, all done." Gerry watched Christy, then signed, "wait, all done," then nodded "yes." Christy responded, "Let's play with something else," signing "play." Gerry smiled and pointed to another child across the room. Together Gerry and his caregiver walked across the room to play with the other child. (V)

In this story, Gerry learned a sign to help with conflict resolution in the future, the "stop" sign. (This sign is very popular in the toddler classroom.) Gerry also actively participated in this regulatory interaction by using signs to indicate that he was waiting to get the toy back, and then that he was all done waiting and was ready to do something else. Together, Gerry and his caregiver peacefully managed a conflict with another child by using words and signs to reflect on and monitor Gerry's internal states, as well as to decide on and modify a course of action.

Using Signs in the Service of Self-Regulation

Once infants have responded to caregivers' regulatory signs and speech, and used signs to actively participate in regulatory interactions with caregivers, the next step in internalizing this self-regulatory self-talk is to use it independently of the caregiver as a means to regulate their own emotions and behavior.

MEGHAN WAITS FOR SNACK

Background: In the infant classroom, the snack area is separated from the rest of the classroom by a short gate, about knee-height for an adult and shoulder-height for an infant. It was typical of several infants to express their anxiousness for snack time by rattling the gate within the small margin that it could move, while their caregivers set up the snack tables.

Meghan (12 months) and Shellie (11 months) were rattling the gate as they watched their caregivers set up for snack. Meghan's caregiver turned to the infants and said, "We're setting up for snack. It'll be ready in a few minutes. I need you to wait for snack while I set up." She signed "snack" and "wait" while she spoke. Meghan then stopped rattling the gate and signed "snack, wait, snack, wait" repeatedly while she watched her caregiver finish setting the tables. (V)

Here Meghan changed her behavior from rattling the gate to signing about her internal state. She signed throughout her wait, seemingly to herself, whether her caregiver was watching or not. Was she using the signs to think out loud, telling herself to wait, or simply expressing that she was waiting? Either way, Meghan used the signs in service of self-regulation while she was anxiously awaiting her snack.

KATE REMINDS HERSELF TO BE GENTLE

Background: Kate, one of the older infants in the classroom, was the youngest child of six. Both of her parents were often stressed, and Kate was treated roughly by older siblings at home. She had become aggressive with younger infants in the classroom, repeatedly targeting one particular child, David. Her caregivers worked with her patiently while protecting the other children. They frequently used the sign for "gentle" (right hand stroking left arm softly) when talking with her about her behavior. "I need you to be gentle with the other children. And other people need to be gentle with you." It had been several weeks since Kate, now 15 months old, had attacked another child when the Child Development Specialist observed the following interaction.

Kate was kneeling on the floor by the toy shelves when she looked across the classroom and saw David. She stared at David intensely, with that look in her eye she gets just before she attacks him. Then she started crawling quickly across the classroom toward him. As she crawled, her left arm jutted out in front of her and she stopped, looked at her arm, and stroked it with her right arm, doing the "gentle" sign. She then altered her path, crawling around David to another section of the classroom. (A)

In this episode Kate clearly changed the course of her own behavior. She stopped her own dominant response, not by telling herself "no," but by reminding herself of a different way to behave, using the same sign her caregivers had used so often with her.

Discussion

As these stories illustrate, infant signs provide preverbal children with a way to communicate with caregivers about what will comfort or reassure them, a way to coconstruct and actively participate in regulatory interactions, and a way to "talk" to themselves in the service of self-regulation.

Adults have internal dialogues of self-talk that we use for self-monitoring, self-planning, and self-regulation. Until now it was assumed that young children did not begin to develop this internal dialogue until they were well into using their first language. However, infants' use of signs makes visible their use of symbols—in the form of gestures—to communicate about their internal states with caregivers and also to "talk" to themselves. This raises the question: Do signs reveal capacities of the infant that were always there, or do signs help infants develop capacities they would not otherwise have?

If language is truly a mental tool for thought, then signs may provide babies with the means to monitor and modify their own emotions and behavior, abilities they would not otherwise have until they were talking. The concepts children represented in the sign stories I have described—internal states like "hurt" or "waiting," adjectives like "gentle," time concepts like "later" or "Popsicle Time"—were all somewhat abstract and difficult concepts. Having a sign as an external representation for these concepts actually gave the infants a way to understand and think with the concepts.

Photo: Baby Signs, Inc. (©2006)

The "Stop" sign. Illustration courtesy of Baby Signs, Inc.

Learn More

Baby Signs

www.babysigns.com

This site offers the "story" of how Baby Signs came to be, as well as curriculum and other products for using the Baby Signs infant signing curriculum.

International Infant Sign Researchers

http://groups.google.com/group/IISR

This Google Groups Web page offers contact with other researchers study infant signing, as well as a bibliography of publications and presentations about infant signing.

Research on Infant Signing

Baby Signs

www.babysigns.com/index.cfm/fuseaction/institute.research/research.cfm

This site offers a summary of the original research on symbolic gestures by Linda Acredolo and Susan Goodwyn, on which the book "Baby Signs" and the Baby Signs® program are based. This site goes on to describe subsequent research on the use of Baby Signs® by parents and child care centers.

Signing Smart

www.wideeyedlearning.com/research.html

This Web site summarizes the findings of a national study by Michelle Anthony and Reyna Lindert on children using the Signing Smart program.

Sign 2 Me

www.sign2me.com/research.php

This site provides references for research articles and a summary of research on signing with both hearing and deaf children, as well as special needs children, based on the work of Joseph Garcia, which emphasized how to teach adults to sign with infants.

Publications:

Baby Signs: How to Talk With Your Baby Before Your Baby Can Talk (Rev. ed.)

L. Acredolo, S. Goodwyn, & D. Adams (2002)

New York, NY: McGraw-Hill

This book provides both a history of the Baby Signs® story— from case study to experimental research— as well as a how-to guide to using infant signs. It is written for a lay audience and is full of engaging photos and stories from both a research and parent or practitioner perspective.

Impact of Symbolic Gesturing on Early Language Development

S. W. Goodwyn, L. P. Acredolo, & C. A. Brown (June 2000)

Journal of Nonverbal Behavior, 24, 81–103. Special Issue: Gesture and Development.

This article describes the original experimental research on the effects of encouraging parents to use symbolic gestures with their preverbal children. Results show that contrary to popular fears, encouraging symbolic gestures actually enhances language development.

[*I think this is duplicative to the prior paper and should be deleted.*]

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

C. D. Vallotton (2008)

Infant Mental Health Journal, 29 234–258

This article describes a study on infants' use of signs to express emotion and feeling concepts. The results show that infants and toddlers are capable of using signs to describe their own and others' emotions, and reveal sophisticated understanding of the social–emotional world in preverbal children.

Infant signs are a form of label that makes difficult concepts accessible to preverbal children. They work not only because children are capable of performing the signs before they can speak the words, but also because signs are physical, more concrete, and thus may be easier to understand than words (Werner & Kaplan, 1963).

Supporting Vygotksy's (1934/1986) hypothesis about the internalization of self-regulatory self-talk, the children's use of signs in both participatory regulation and self-regulation was very similar to the ways that caregivers used them (e.g., later at "Pops Time," "wait" for "snack," be "gentle"). This parallel use of signs implies two things about children's social cognition. First, preverbal children have a sense of shared meaning for the content of the signs. Second, they have a certain degree of consciousness about the socially constructed appropriateness of their own behaviors.

In conclusion, infant signs allow children to take self-regulation into their own hands. They provide children a way to participate with caregivers in regulatory interactions and to begin to develop the internal dialogue that will become their own conscious and self-regulatory self-talk.

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