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TELLING THEIR STORIES:

Representation and Reenactment of Traumatic Experiences Occurring in the First Year of Life

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The theme of this issue of *Zero to Three* is the role of somatic and nonverbally based early childhood experiences in the young child's development, and more specifically, how infants and toddlers use their bodies to learn and communicate. This article will focus on the extreme end of the continuum of experiences that can have dramatic developmental effects, namely experiences of trauma. In particular, I will discuss infants in the first year of life who have experienced single or very circumscribed episodes of trauma in the context of otherwise relatively normal developmental trajectories.

Although there has been little question that a trauma occurring in the preverbal period can have significant effects on children's physiological and behavioral organization, the question of whether a trauma is internally represented (i.e., remembered) and whether it has specific developmental effects beyond its more generalized disruptive impact has been less clear. Clinical and research data suggest that infants, even in the first year of life, can regis-

ter and remember salient aspects of observed and/or experienced events, including traumatic ones, for periods of weeks, months, and even years. These retained internal representations can significantly alter infants' subsequent

at a glance

- Young infants who experience pain may show heightened reactions to pain even years later.
- Children may remember, and may even reenact, traumatic experiences that occurred when they were infants.
- A child's reenactment of a trauma may not exactly replicate the event, and may change over time.
- Imitation or reenactment of observed and/or experienced events is a fundamental, biologically programmed mechanism by which children learn about themselves and others.

responses to the world around them by creating distorted perceptual prisms through which they interpret environmental stimuli. By producing heightened arousal, enduring somatic sensations, and traumatically driven reenactment behavior, these internal representations can also have profound and enduring effects on children's experiences of their own bodies.

Keeping with the theme of how infants use their bodies to learn and communicate, reenactment behavior is of particular interest. Following a review of clinical and research findings pertaining to memory, I will discuss recent research on imitation that has shed light on the neurobiological processes underlying children's compelling propensities for translating experienced events into action. This work documents the degree to which perception and motor activity share common neuroanatomical and representational domains and suggests that the imitation or reenactment of observed and/or experienced events is a fundamental, biologically programmed mechanism by which children learn about themselves and others.

Clinical and Research Findings

The following paragraphs discuss clinical and research findings pertaining to the internal representation of circumscribed traumas occurring in infants prior to 2 months of age, 2–6 months of age, and 6–13 months of age.

Zero to 2 Months of Age

For circumscribed traumas occurring prior to 2 months of age, information concerning enduring effects is scarce. One area that has been studied relates to the presence of persisting "somatic memories" in association with pain. For example, Taddio, Katz, Ilersich, and Koren (1997) found that infants who were circumcised as newborns showed an increased pain response to vaccinations given between 4 and 6 months of age. Two studies have reported persisting cutaneous hypersensitivity to pain following repeated heel pricks in the newborn period (Fitzgerald, Millard, & McIntosh, 1989; Liley, 1972). In addition, as a practitioner I have encountered two instances of children who experienced repeated heel pricks as newborns and evidenced similar hypersensitivity years later. In one case, a young adult completely unaware of his newborn experience reported to his parents that whenever he was under stress, his heels hurt. Consistent with these clinical observations, Ruda, Ling, Hohmann, Peng, & Tachibana (2000) studied rats whose paws were exposed to pain stimuli in the first weeks of life. As adults, the rats demonstrated both hypersensitivity to pain and increased

sprouting of nerve endings in the afferent sensory spinal regions subserving the affected limb.

We know little about the internal world of the neonate. However, given that newborn infants can manifest all of the physiological responses to pain (Anand & Hickey, 1987) and are capable of both instrumental and classical conditioning (Blass, Ganchrow, & Steiner, 1984; DeCasper & Fifer, 1980; Little, Lipsitt, & Rovee-Collier, 1984), there is every reason to

believe that in the first weeks of life—and certainly by 2 months of age—an infant could conditionally pair a traumatic stimulus with a stress response, resulting in distress upon later reexposure to stimuli closely approximating the traumatic ones. Sander's (1995) demonstration that newborns show affective and behavioral disorganization when expectations (experiential-perceptual gestalts) based on previous interactions are

disrupted, and Gunther's (1961) description of newborns who experienced an anoxic airway obstruction during feeding and subsequently resisted being put to the breast are consistent with this hypothesis.

Two to 6 Months of Age

Within this time period, there is strong evidence that infants can retain internal representations, or "cognitive-affective schemata" (Gaensbauer, 1982, p. 61) of a trauma, particularly in a form that would be described as recognition memory. In other words, when children are exposed at a later time to a stimulus reminiscent of the original trauma, they can show distress, hyperarousal, behavioral disorganization, and avoidance. Given the limited modes of communication available to them, it is difficult to know whether an infant under the age of 6 months is capable of evocative memory (i.e., some form of spontaneous, sensory-based, internal reexperiencing in the absence of an external stimulus), and to what degree any such internal sensory "images" might be retained over time. However, several of the cases reported in the literature are suggestive of that possibility.

Two children from my own practice had been severely abused by their fathers prior to placement in foster care, one in several isolated incidents prior to 3 months of age (Gaensbauer, 1982) and the other repeatedly up to 2½ months of age (Gaensbauer, 2002). Both children showed ongoing fear responses when approached by an adult male both at home and during playroom observations, with distress triggered by visual, auditory, and gestural stimuli. Such distress responses lasted several weeks in the first case and more than 7 months in the second case. Another child placed in foster care at 4 months of age had been severely

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traumatized by a psychotic mother who would force him to hold his legs in an awkward, rigid position and in delusional states would undress him and wrap him in cold, wet towels to the point of suffocation. At 9 months of age, he was reunited with his mother for a supervised visit. The mother immediately began to undress him, whereupon the infant started to scream and the visit was stopped. This brief visit appeared to trigger schemata associated with his previous traumas. For the next week, the infant cried almost constantly and held his legs in the same awkward position upon which his biological mother had insisted.

Other reports in the literature have confirmed that infants who have experienced traumas prior to 6 months of age can show evidence of enduring memories in various forms. Roy and Russell (2000) reported that an infant who had experienced a series of painful medical procedures beginning at 2 weeks of age was by 5 months of age showing symptoms characteristic of post-traumatic stress disorder (PTSD) emotional reexperiencing, including hypervigilance, fearfulness of hospital staff, and extreme distress evoked by even minor, painless procedures. Representations of early trauma can also take the form of behavioral reenactment, as in the case described by Terr (1988) of a child sexually abused prior to 6 months of age who at 3 years of age carried out a variety of sexual acts with dolls, the accuracy of which was confirmed by pornographic photos taken at the time of her abuse. Perhaps the most dramatic case is that of Bernstein and Blacher (1967) of a 28-month-old child who, prompted by environmental cues associated with her earlier hospital experience, verbally reported memories associated with a pneumoencephalogram that she had experienced at 3 months of age.

Six to 13 Months of Age

By 6 months of age, there is strong evidence that infants are capable of enduring internal representations that can be manifested through a variety of expressive modes, but particularly through motoric action. Perhaps most relevant for our understanding of how memories for trauma may be expressed are studies of deferred imitation. In this paradigm, the children observe an experimenter demonstrate an action with dolls or toys but is not allowed to touch the items directly (i.e., they are not given the opportunity for procedural learning). By 6 months of age, infants can imitate a single action with a toy after a 24-hour lapse (Barr, Dowden, & Hayne, 1996; Collie & Hayne, 1999). Their ability to imitate increasingly complex actions with longer and longer periods of delay expands dramatically during the next year (Bauer, Herts-gaard, & Dow, 1994; McDonough and Mandler, 1994; Meltzoff, 1988).

I have reported on a number of children who, after being traumatized between 7 and 13 months of age, manifested memories for aspects of their traumas through various expressive vehicles—including reactivity to traumatic triggers, physical reenactments with their own bodies, drawings, reenactments with toys, and verbalization—within time frames ranging from 5 months to 7 years after the traumatic events (Gaensbauer, 1995; Gaensbauer and

Harmon, 1982). A 15½-month-old child, who had been placed in foster care at 10½ months of age after suffering a skull fracture as a result of abuse, appeared completely comfortable during a structured playroom evaluation until a specific moment during developmen-

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tal testing when his traumatic memories appeared to have been triggered. When I made an open-handed gesture encouraging him to put cubes into a cup, he abruptly froze, grimaced, and flinched as if he expected to be hit. A child who was involved in a frightening auto accident at 9 months of age was able, at 23 months of age, to play out with dolls and toys the essential details of how her car was hit, rolled on its side, went over an embankment, and landed head first in a dry river bed. Similarly, at 26 months of age, a child who at 13 months of age had received emergency treatment for an accidental drug overdose played out several details from his ambulance ride and emergency room treatment. This included using a toy thermometer to repeatedly brush the face, shoulders, and chest of the doll that represented him. I did not understand this action until his mother explained that in the emergency room, he had been given an emetic and the nurses had had to frequently wipe him off after he vomited. A fourth case involved a boy who had been severely physically and sexually abused by his father during a 1-week period immediately prior to his placement in a foster-adopt home at 7 months of age. At 8 years of age, in a therapy session with a colleague of mine, the child suddenly entered a frenzied, dissociated state during which he reenacted with his own body the experience of being abused. He screamed in fear, crawled on the ground with his buttocks in the air in a very sexualized manner, attempted to hide under the couch to get away from the therapist (who at that moment he was seeing as his abusive father), and described in words how he was being hurt.

Perhaps the most dramatic case was that of a child who at 12½ months witnessed the explosion of a letter bomb that killed her mother and fatally wounded a friend of her mother. At 4½ years of age, she reenacted important elements of that event both in bodily action and in play with toys. During our first meeting, when I asked how her mother had died, she abruptly fell upon an inflated “bop” bag and began very agitatedly thrashing back and forth on the ground. Such falling and thrashing body movements

had been repeatedly observed at home and appeared to replicate the movements of the two victims, particularly her mother's friend who was on the floor screaming and writhing in pain when help arrived. Later in the same session, I used dolls to re-create a scene resembling the situation immediately prior to the explosion. She initially portrayed a number of nurturing interactions between the mother and baby doll, but then, holding the baby doll, very suddenly and forcefully brought her hand across the play scene, scattering the dolls and toy furniture in every direction. The action was so compellingly and poignantly reminiscent of the effects of the explosion that it left her adoptive mother in tears. The child then stood the baby doll within several inches of the "mother" figure (the first witnesses upon the scene found the child

standing several feet from the mother's body, staring). When I introduced a policeman figure, the child placed it by the mother figure and then said something that because of her articulation difficulties I did not understand but which her adoptive mother reported to me was, "She's dead!"

This child showed many other indicators of persisting imagery. For example, in her paintings she repeatedly drew red and brown splotches, saying, "It's icky!" She also manifested continuing intense distress reactions to vestibular/kinesthetic, visual, auditory, and tactile stimuli that evoked some aspect of the traumatic experience. At the age of 5½, during a treatment session with another therapist, she verbally reported details about her mother's appearance after the explosion that her adoptive parents had not known but that the police subsequently confirmed.

Several additional cases of children traumatized in the first year of life who showed similar persistence of traumatic representations have recently come to my attention. In a personal communication, Irene Chatoor described an 18-month-old child with a feeding disorder who had been placed in foster care as a result of physical abuse at 10 months of age. Nurtured by a very sensitive foster mother, her feeding difficulties improved significantly except for a persisting phobic reaction to bottles. At 18 months of age, when Chatoor presented the child with a baby doll and a toy bottle, the child initially put the bottle to the child's mouth as if giving a feeding. Within seconds, however, she began hitting the baby doll over the head with the bottle, making the reasons for her bottle phobia very evident. The biological mother confirmed in a subsequent interview that she had frequently hit the child with the bottle in anger.

Another case shared by a colleague involved a child with a history of significant abuse/neglect and multiple developmental delays who, among other traumas, at 12

months of age had fallen out of a second story window and suffered a significant head injury. In play therapy at 3½ years of age, over a several-week period and without overt reference to the earlier experience, the child repeatedly played out a scene of a doll figure falling head over feet from a dollhouse window, but then "floating" without ever hitting the ground.

Gearity (2001) has reported on her work with a child whose mother was fatally stabbed, reportedly multiple times, by the child's father when the child was 11 months old. The infant and her two siblings were then left in the house with their deceased mother for more than 20 hours. The child was permanently placed, at 13 months of age, with a family living in another community. From that time forward, except for a few closely supervised visits with her

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biological grandparents between 13 and 15 months of age (during which time they were not allowed to mention her biological parents), she had no contact with her siblings or any other biological relatives. At age 2, after repeated episodes of unprovoked, dissociated aggression, Gearity felt that the early trauma involving her biological parents needed to be addressed. In a session when the child was 25 months of age, Gearity introduced a male and a female doll. The child's first reaction was to bang the dolls together as if they were fighting. She moved away briefly, but then returned to Gearity and asked, "Did he cut her?" Gearity responded, "Yes." After another brief interlude, she raised her shirt and pointed to a spot just underneath her collarbone and said "Red!" Approximately 2 years later, Gearity and the child's adoptive parents reviewed police photographs taken after the mother's death and learned, to their amazement, that the mother had not died of multiple stab wounds. Rather, she had suffered a single fatal wound in the exact place to which the child had pointed on her own body. All of the other wounds, having been inflicted after the mother's death for purposes of mutilation, had not bled.

Discussion

Many unanswered questions may be raised about the significance of such clinical observations, given the uncontrolled and often limited nature of the information available and the possibilities for alternative explanations. In every one of the clinical cases cited, parents uniformly denied ever talking about the trauma with the child. The children's reenactments were generally not completely spontaneous, but required some degree of adult structuring and/or some form of naturalistic or therapeutic cueing. (For more detailed descriptions of the nature of the memories and the manner in which they emerged, readers should refer

to the original sources cited within the preceding text.) It is hard to say to what extent these cases are typical, taking into account the enormous individual variation in how a trauma is registered and in children's memory processing. Yet they certainly draw attention to very young infants' potential for registering and retaining salient elements of a traumatic experience. As such, these experiences have important implications for our understanding of the continuing influence of traumatic representations on the child's perceptions of the world, for our understanding of the nature of early memory, and for therapeutic work with traumatized young children (Gaensbauer, 1994, 1995, 2000, 2002; Gaensbauer & Siegel, 1995).

One particular issue of note is the influence of such representations on the child's body relatedness, or what Tortora (1994) refers to as the child's "dance," as manifested through traumatic reenactment behavior. This reenactment behavior can, in many respects, be considered a variant of deferred imitation. Starting with the pioneering studies of Meltzoff and Moore (1977), newborn infants have been shown to imitate a variety of facial and manual movements, including tongue protrusion, head and hand movements, and even components of facial expressions of emotion (Meltzoff & Moore, 1997). Thus, it appears that infants are programmed from birth to translate perceptions into actions. Very young infants are also capable of cross-modal matching (i.e., integrating input coming via different sensory modalities to identify a common source and uniting that disparate input into a common representational framework). To explain these observations, Meltzoff (1990) has postulated that "neonates can, at some level of processing, apprehend the equivalence between body transformations they see and body transformations of their own that they 'feel' themselves make" (p. 6), a capacity he has termed active intermodal mapping (AIM). In the course of development, as infants become aware of the particular mental and/or emotional states accompanying their own bodily actions and then observe others acting similarly to them, infants are thought to be able to "use the behavior-mental state mappings registered through their own experience to make inferences about the internal states of others" (Meltzoff, 2002, p. 35). These innate capacities to imitate and to recognize equivalencies between observed and executed acts are seen as essential building blocks in children's development of a sense of self and other, including a theory of mind.

Fundamental links between perception and action and between self and other awareness have been supported by a considerable body of new research on the neural underpinnings of imitation. Decety (2002) has reviewed evidence suggesting that, "[N]eural and cognitive representations involved in the generation of actions are also recruited by observation and by mental simulation. Thus, perception and action are not separate phenomena. Rather there is a common neural substrate that directly translates sensory

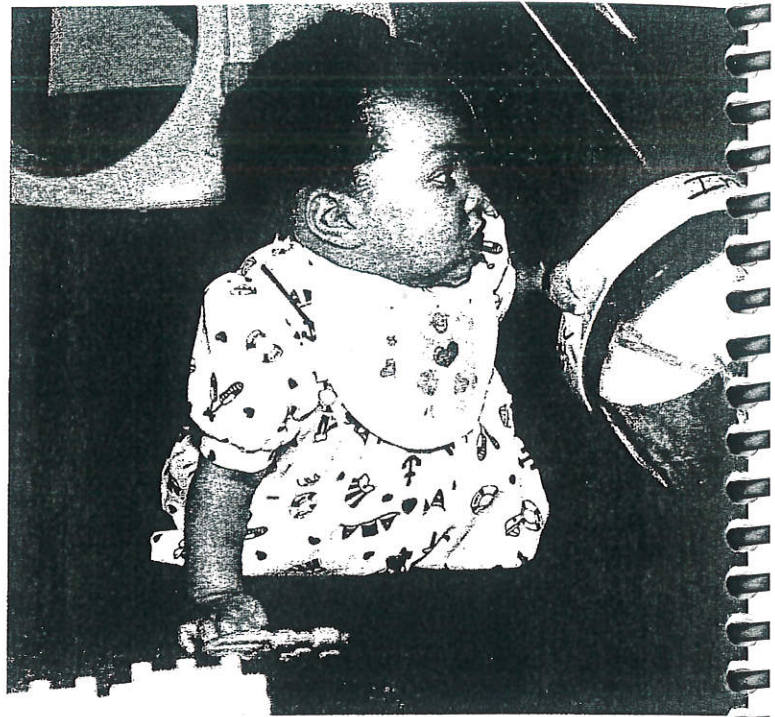


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experience into action or schemas of actions" (p. 305). Examples of findings leading to these conclusions would be the identification of "mirror neurons" in the premotor cortex of the monkey brain which discharge both when an action is being observed and when it is being carried out (Gallese, Fadiga, Fogassi, & Rizzolatti, 1996; Rizzolatti, Fadiga, Gallese, & Fogassi, 1996), as well as a number of brain imaging studies that have identified common brain regions subserving both the perception and production of actions (Decety & Grezes, 1999; Decety et al., 1997; Iacoboni et al., 1999). There is insufficient space to describe this research in any detail, but for an excellent overview, readers should consult the recent volume edited by Meltzoff and Prinz (2002).

Documentation of the intimate coupling between sensory experiences and motoric actions that replicate these experiences provides important depth to our understanding of the representations that underlie reenactment behavior. Considering infants' capacities to incorporate the different elements of an experienced event, including affect, into a common representational field, the term "cognitive-affective schemata" does not do these representations justice. "Perceptual-cognitive-affective-sensory-motor schemata" would be more accurate. Given that these systems appear programmed from birth, in combination with the fact that powerfully imprinted perceptions such as those associated with a trauma are likely to be particularly strong elicitors of motoric action, it is extraordinary but perhaps not completely surprising that a trauma in the first year of life could create sufficiently strong representational impressions as to produce reenactment through bodily action at much later points in time.

Because imitative and reenactment behaviors appear to have such a strong biological basis and are seen at a time of extreme immaturity in cognitive functioning, categorizing

these early forms of memory has been a challenge to clinicians and researchers alike. Historically, it was generally assumed that infants were not capable of evocative memory, that early memory was habit/procedural in nature, and that "behavioral memories" such as the ones described here would fall under the implicit/procedural rubric (Nelson, 1995; Siegel, 1995; Terr, 1988). Recent developmental research and the clinical observations summarized here have called these assumptions into question. In a recent article (Gaensbauer, 2002), I have reviewed why I believe that many of the manifestations of memory described here can be considered forms of declarative memory, thus supporting the conclusions of Meltzoff (1990), Rovee-Collier (1997), and others to the effect that procedural and declarative memory do not emerge independently and sequentially in development, but rather develop simultaneously and in complementary fashion to each other.

Moreover, even if one postulates that the multifaceted representations of trauma described here have been originally encoded and expressed implicitly, considering the brain's complex and reverberating circuitry there is every reason to believe that explicit memory systems would have access to previously encoded implicit memories. In other words, as Meltzoff (2002) hypothesizes, in carrying out specific behavioral acts young children are likely to register and remember the particular mental and/or emotional states that accompany their bodily actions. Supporting the hypothesis that these early representations are accessible to later-developing cognitive functions is the fact that, in the absence of any verbal ability at the time of their traumas, two of the children cited here were later able to use words to specifically describe what they had seen, and several others used words to accompany their behavioral reenactments.

In considering the adaptive function of such "perceptual-cognitive-affective-sensory-motor" schemata, it is important to note that the traumatic reenactments described above were not veridical replications of what the children observed or experienced, nor were they static and unchanging. Rather, they were characterized by the creative, holistic, and integrated use of multimodal expressive pathways to capture essential elements of the traumatic experience, particularly the concrete, experience-near aspects of the events that one would expect to have been most perceptually salient to a very young child. It appears as if, having created an overarching or "supramodal" (Meltzoff, 2002, p. 24) representational framework of the experience, children can use this framework as a basis for portraying their own experience as well as the experience of others from multiple perspectives. For example, the children who experienced the physical sensations of the auto accident and the drug overdose in the first person were able to take those experiences and project them onto a play stage with dolls and toys, assigning themselves as the role of the third person observer/director. The child who witnessed her mother being killed by the letter bomb—in

addition to playing out and verbally describing what she observed in the third person—also placed herself in the first-person role of her mother and her mother's friend when she repeatedly enacted the falling/thrashing game. The child who had been abused by his father presumably played out, in direct procedural fashion, bodily positions and sensations that were associated with his own abuse. The child who at 11 months of age observed her mother's stabbing not only inflicted on others the violence she witnessed but was able to translate what one assumes were enduring visual images of what she saw into verbal descriptors of being "cut" and "red," as well as indicating with a nonverbal gesture the location of her mother's wound using her own body. The child who fell out of the second-story window played out without conscious awareness what appeared to be a reparative fantasy, that of being able to float harmlessly above the ground rather than being hurt.

The complexity of what young children are doing with these traumatic representations is most impressive. My own interpretation is that with the resources available to them they are, in common with all trauma victims, "telling their story" in order to master the overwhelming affects, develop a coherent narrative, and ultimately integrate the experience. The inborn biological mechanisms, present from birth, that inextricably link perception, representation, affect, and motoric action serve to make such "telling" possible, particularly for the young child. Developmentally, as children reenact or "retell" their experience via multiple sensory modalities and from multiple perspectives, they have the opportunity to become aware of what they are experiencing and doing, impart meaning to their traumatic representations, and bring to bear more advanced coping capacities to aid in their processing. By using their bodies to "tell their stories" in action, children are also placing their experiences on a public stage, thereby allowing caregivers to intervene in ways that can promote alterations in the traumatic representations, ideally in the direction of healing. §

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