



Changes in infants' affect related to the onset of independent locomotion

Pamela G. Whitney*, James A. Green

Department of Psychology, 406 Babbidge Rd., Unit 1020, University of Connecticut, Storrs, CT 06269, United States

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ABSTRACT

Previous research suggests that after gaining several weeks of independent locomotor experience, infants may show both more negative and more positive affect toward parents. However, this prior work has been based largely on parent report, and no studies have used longitudinal or naturalistic methods to chart changes in infants' affective expressions as they gain locomotor ability. Fifteen infants were observed at home before, during, and after learning to crawl in two naturalistic contexts, free play and dyadic play. Expressions of negative affect during free play *decreased* after the onset of crawling, but there was no change in expressions of positive affect. At the same time, however, mothers reported an *increase* in both negative and positive reactivity. These results are discussed in terms of the contexts typically assessed during observations and the different sensitivities of mothers to infants' expressions of affect. Several lines of evidence point to a potential role for independent locomotion in the reorganization of affective expressions.

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1. Introduction

At some point in their second half year of life, infants achieve the ability to move around their environments independently. This milestone has been identified as one that will transform the infant's social world by offering interactions that include a wider variety of objects and people as well as opportunities to consolidate attachment and social referencing skills (Ainsworth, Blehar, Waters, & Wall, 1978; Campos et al., 2000; Green & Gustafson, 1997; Mahler, Pine, & Bergman, 1975). This relatively sudden and universal change in how infants relate to their environment offers researchers an ideal entree into the study of linkages between socioemotional development and other developmental processes.

Indeed, theoretical interest has recently been sparked by the notion that changes in expressions of affect might be explicitly tied to the development of independent locomotion (Campos et al., 2000). Empirical support for the idea can be found in Campos, Kermoian, and Zumbahlen (1992), who found that mothers of newly crawling infants reported increases in expressions of anger as well as new and more intense forms of affection from their infants. Mothers of the crawlers also reported increased engagement in interactive play, checking back to the mother in prohibited contexts, attention to distal objects, and sensitivity to caregivers' departures.

What would cause infants to express more negative emotions after learning to crawl? One suggestion is that crawling infants engage in more goal-directed behavior, such as exploring the stairs or crawling into kitchen cabinets, that may be at odds with goals of the parents (Campos et al., 1992). Chen, Green, and Gustafson (2009) did, in fact, demonstrate that crawling infants receive more prohibitions from parents than their same-age counterparts and were more distressed by those

* Corresponding author. Tel.: +1 860 486 5590.

E-mail addresses: pamela.whitney@uconn.edu (P.G. Whitney), james.green@uconn.edu (J.A. Green).

prohibitions; that is, they were more likely to protest against them. Thus, although crying and other negative expressions generally decrease during the last half of the first year (Barr et al., 1991; Bell & Ainsworth, 1972; Brazelton, 1961; St James-Roberts & Halil, 1991), negative expressions may increase briefly after crawling, at least in certain interactional contexts (e.g., limit setting).

But locomotor experience may have even more diverse effects on infants' socio-emotional development. Crawling infants have been reported by parents to show more affection (Campos et al., 1992). And, as infants gain the ability to explore further from their parents, attachment has been said to be strengthened and tested (Ainsworth et al., 1978; Mahler et al., 1975). Using an experimental design, Gustafson (1984) demonstrated that the increase in positive affect associated with independent locomotion is due to infants' increased independence rather than other factors. Precrawling infants who had experience at home using a walker were observed in a laboratory play setting, either playing on the floor, or while in the walker. Same-age crawling infants were also observed. When the precrawlers were given locomotor ability with the walker, they behaved similar to the crawlers; that is, they looked and smiled more at adults, and initiated more social interactions, as well as paid more attention to distal objects around the room.

Several important conclusions about the role of locomotion emerge from this experimental study. First, because infants were systematically given the ability to locomote, differences between locomotors and prelocomotors should not have been the result of other individual difference factors that happen to correlate with locomotor development. Importantly, it is unlikely that pre-existing temperamental differences caused the changes in affective expressions. Finally, it does not appear to be the act of crawling per se driving these changes, but rather the potential for new social experiences created by independent locomotion.

To summarize, observational studies suggest that when infants gain locomotor experience they become more easily distressed when limits are placed on their behaviors, and they also become more active in social interchanges. Parent report data appear to corroborate the observational data in that parents report more anger from crawling infants. The parent report data also indicate that crawling infants are more affectionate, a finding supported by the experimental study of Gustafson (1984) showing that providing independent locomotor ability increases infants' smiling and looking at adults.

These previous studies of affect and the development of independent locomotion have been done in laboratory contexts or have focused on episodes involving prohibitions of infants. An important next step is to consider how locomotor experience might influence infants' behavior in other contexts. Two other contexts that have traditionally been important in socioemotional development are free play and dyadic, mother–infant interaction. Both contexts are prominent throughout the period of infancy and both contexts potentially permit a range of affect and expressions.

In addition, free play and dyadic play may hold different challenges for precrawling and crawling infants. Free play, for example, could be a somewhat challenging context for infants who are just on the verge of crawling and are faced with multiple failed attempts, whereas infants who are already crawling might enjoy the opportunity to explore. Conversely, crawling infants might find dyadic play more challenging, especially if they perceive a loss of independence. Thus, crawling infants might express less positive affect, and perhaps even more negative affect, than precrawlers during dyadic play.

A second important next step in examining the role of independent locomotion in socioemotional development is to employ longitudinal designs. Currently, no published studies exist that compare the same group of infants before and after crawling. Neither the previous cross-sectional studies (i.e., Chen et al., 2009), or the “age held constant” studies (e.g., Biringen, Emde, Campos, & Appelbaum, 1995) permit tracking of affective expressions alongside changes in locomotor ability. Of course, longitudinal designs do just this, using individual infants as their own comparison group.

Thus, the purposes of the current study were to observe infants longitudinally over the onset of crawling and to do so in two naturalistic contexts, free play and dyadic play. Infants' affective expressions were observed monthly from 6 months of age until one month following the onset of independent locomotion. We expected that free play would be a challenging context for precrawling infants, and we hypothesized that negative affect would decrease significantly during free play between the final two observations; that is, after infants gained locomotor experience. Predictions about affect expressions during dyadic play were less straightforward. Some of the research reviewed above suggested that independent locomotion might engender an increase in negative affect during free play (e.g., Campos et al., 2000) whereas other research supported the idea that independent locomotion might result in an increase in positive affect. Therefore, we expected that there might be increases in both negative and positive affective expressions once infants gained independent locomotor ability.

In addition to the observational data, maternal perceptions of changes in infants' affective expressions were also collected. To do this, mothers were given the reactivity scales from the Infant Behavior Questionnaire – Revised (Gartstein & Rothbart, 2003) at the first and final home observations; in other words, when infants were 6 months of age and not yet crawling and again when infants had about one month of crawling experience. It was expected that mothers would report increases in both positive and negative affect over that time.

2. Methods

2.1. Participants

Seventeen infants and their mothers were recruited for the study through local day care centers and mothers' clubs. One dyad did not complete the study due to scheduling difficulties and another was excluded after the first visit due to a pediatrician's concerns of general motor delays. The remaining fifteen infants included 6 males and 9 females; 5 were first

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