

Differences in the Angry Behaviors of Precrawling and Crawling Infants

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Abstract

With the onset of independent mobility, infants are able to freely explore the environment, providing many new opportunities for social interaction and physical experiences. Novel contexts can be discovered and new goals may be set, resulting in increased opportunities for nonfulfillment of those goals, possibly leading to frustration and anger. A mixed-methods approach was used to study the changes that occur in anger with the onset of crawling. A paired samples t-test revealed significant differences in anger between precrawlers ($M=1.65$, $SD=.36$) and crawlers ($M=2.42$, $SD=.47$), with the crawlers demonstrating higher mean anger scores on the Scales of Socioemotional Development after four weeks of independent crawling; $t(21)=-7.8$, $p = .000$. A longitudinal collective case study approach revealed that infant anger increased in intensity after one and three weeks of crawling experience, then declined slightly after six weeks.

Keywords: Crawling, Anger, Emotional Development, Mobility, Infants

1. Introduction

Emotional development is a complex phenomenon that is a fundamental component of human development (Garvey & Fogel, 2007). Many theories of emotional development recognize that affective experiences and expressions undergo a transformation with the development of the child (Malatesta, Culver, Tesman, & Shepard, 1989). One particular skill that has been suggested to facilitate an emotional transformation is the onset of crawling (Bertenthal & Campos, 1990). Once a child becomes mobile, the relationship between events and goals increases in complexity (Barrett & Campos, 1987). As an infant begins to independently explore the environment and travel outside the perimeter of his own reach, many opportunities for social interactions and physical experiences arise. Novel areas can be explored, increasing the number of contexts for activity, and new goals can be established, resulting in increased opportunities for the attainment of those goals, as well as new possibilities of failure (Benson 1990; Zachry & Mitchell, 2012). These frustrating situations may lead to angry emotional responses. Research by Campos, Kermoian, and Zumbahlen (1992) revealed that mothers of newly crawling infants reported increases in the frequency and intensity of anger, likely due to goals not being met or being blocked. Some mothers in the study associated the onset of crawling with the beginning of their children's temper tantrums. During home visits in the observational component of a study by Whitney and Green (2011), the researchers observed infants beginning at the age of six months and continued the observations intermittently until after the onset of crawling. The researchers documented that infant negative affect decreased during free play after the onset of crawling, with no significant changes in expressions of positive affect. However, in the same study, mothers reported that their infants displayed increases in negative and positive emotionality once crawling. The authors suggested that the increase in emotionality reported by the mothers may not have been detected during the structured study observations because the researchers were limited to observation of the infants in the context of the home.

In contrast, the mothers may have reported increases in anger and happiness because they were reporting on

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day-to-day observations from multiple contexts. The objective of the current study was to examine how infant anger changes as crawling experience is gained. To date, the research findings are mixed related to the study of how crawling experience influences infant anger. The current study will offer a fresh perspective to this minimally research topic by providing a description of the changes in anger that occur as crawling experience is gained. It was determined that a mixed-method approach integrating both quantitative and qualitative research methods would be the optimal approach to adequately address this research topic(Gay & Airasian, 2003).

Method

2.1 Participants

Participants were drawn from a larger study that investigated crawling as it relates to infant emotional development. There were 44 participants (49% male) ages 32 to 44 weeks (mean = 36.95; SD = 4.02) in the current study (see Table 1). Infants in both samples were typically developing and healthy based on parental reports.

Table 1: Demographic Information for Precrawlers and Crawlers

	Gender (%)		Age (weeks)	Mean (SD)	Range	Ethnicity (%)		
	Boys	Girls				White	African American	Asian
Precrawlers (n = 22)*	40.9	59.1	45.2	36 (3.46)	30-44	86.4	1	.5
Crawlers (n = 22)*	40.9	59.1	51.5	37.6 (4.37)	30-44	95.5	.5	0

On the initial day of data collection, one female and two male precrawlers were selected from the precrawling sample of infants for bimonthly observations until four weeks of crawling experiences was gained. All three infants had attended the childcare center since the age of eight weeks and were familiar with the setting and classroom staff. On the first observation, the female was 32 weeks of age and the males were 30 and 33 weeks old. Additionally, data for all three participants were documented using the SSD and included in the precrawler group for the cross-sectional portion of the study.

2.2 Procedure

IRB approval was obtained prior to initiation of the study. Initial contact was made with the childcare center administrators by telephone and the purpose of the investigation was explained to the director of each center. Written consent was obtained from the directors to conduct the observations and videotaping, and informed consent and a brief questionnaire related to infant crawling status were obtained from the parents of each infant. If the parents indicated that their infant was crawling on hands and knees, they were asked to provide their best estimate of when the infant began crawling independently. One caregiver requested that their child not be videotaped so that child was excluded from the study. To examine the evolution of anger from precrawling to crawling, a mixed-methods study design was implemented. A cross-sectional design was utilized to measure differences in anger between precrawlers and crawlers, and a longitudinal collective case study approach was used to understand how infant anger evolves as crawling experience progresses. For the cross-sectional portion of the investigation, participants were split into two groups: crawling and precrawling, with the following requirements: (1) one group of infants had no experience with crawling; (2) the remaining group had acquired at least four weeks crawling experience based on parental reports; and (3) each precrawler was matched by age and gender to a crawler. In a previous study, Campos et al. (1992) discovered changes in infant emotionality after four weeks of experience with crawling. In keeping with this early work, a benchmark of four weeks was utilized for the final measurement of anger.

For the longitudinal case study observations, the researcher documented descriptive examples of the infant’s angry behaviors and actions as a precrawler, at crawling onset, and as crawling experience was gained. For the three infants, a total of 12 four-hour observations were completed over a period of six weeks. The initial plan was to observe each infant as a precrawler, after seven days of independent crawling, and after three and five subsequent weeks of crawling. Due to infant absences, and holiday breaks, it was not possible to follow this schedule exactly. For the three case studies, field notes were kept that provided detailed descriptions of the infants’ activities, interactions, and emotional behaviors. Following each data collection visit, the researcher reviewed the videotapes,

transcribed the field notes and wrote a concise observation record that included impressions, personal reactions, and emerging themes.

2.2.1 Instrument.

For the cross-sectional part of the study, the primary researcher used the Scales of Socioemotional Development (SSD) to document specific angry expression and behaviors. The SSD is a checklist that provides a mean score that represents the frequency and intensity of angry emotions. There are eight situations on the SSD that evoke anger (see Table 2). The authors of the SSD define anger as an emotional state involving behaviors such as protesting and moving toward a stimulus that usually result “from an interruption in an activity or a failure of events to conform to particular expectations” (Lewis & Michalson, 1983, p. 269). When necessary, the videotapes were reviewed to complete the checklist. The primary and secondary researchers reviewed the videotapes and completed the scoring sheets. Following the procedures outlined in the SSD, the data for the scales were later transferred to the SSD coding scores sheets item by item to score each child’s angry responses, and a mean score for anger was calculated.

Table 2: Situations on the SSD that Possibly Provoke Anger

When the child wants something another child (peer) has
When another child (peer) receives special attention
When another child (peer) grabs the child’s toy
When another child (peer) attacks the child
When the caregiver teases the child
When the child watches the caregiver hide the toy
When the caregiver scolds the child
When the child breaks a toy

Lewis and Michalson (1983) reported that the internal consistency of the SSD is acceptable, and according to the authors, the SSD demonstrated 90% inter-observer agreement for anger. In order to assess inter-rater reliability, a trained secondary investigator used the SSD and reviewed 50% of the videotaped observations, and an interrater reliability analysis was completed. The interrater analysis result was satisfactory, Kappa = 0.789, $p < 0.001$.

2.3 Analysis

2.3.1 Cross-Sectional Component

Twenty-two precrawlers and crawlers were matched on gender and age ($n = 44$). To determine if there were differences in mean anger scores between the two groups, a paired samples t-test was run.

2.3.2 Case Studies

To examine the transition in anger that took place as crawling experience was accrued, a longitudinal collective case study approach was utilized.

2.3.3 Data Coding

For the case studies, constant comparison and inductive analysis methods were utilized (LeCompte & Priessle, 1993). The transcripts were read and re-read to generate the initial codes, a process known as open coding (Strauss & Corbin, 1998). This involved organizing the expressions and behaviors into codes with no specific meaning (Rossman & Rallis, 2012). Using AtlasTi (Muhr, 2004), a software program for qualitative data analysis, similar codes were grouped into categories or preliminary themes, then compared and contrasted, until a list of major themes was generated (Miles & Huberman, 1994). Throughout the review of the documents, the investigator documented memos in ATLAS.TI, identifying patterns related to changes in anger that occurred with crawling experience. A critical analysis of the themes was then completed.

3. Results

3.1 Cross Sectional Analysis

Matching the participants on age and gender, a paired samples t-test was run to determine if there were

differences in mean anger scores between precrawlers and crawlers. Mean anger scores were normally distributed, as assessed by Shapiro-Wilk's test ($p > .05$) and based on the inspection of a box plot, there were no outliers in the data. After four weeks of crawling experience, there was a significant difference in the mean anger scores between precrawlers ($M=1.65$, $SD=.36$) and crawlers ($M=2.42$, $SD=.47$); $t(21) = -7.8$, $p = .000$.

3.2 Cross-Case Analysis

Four major themes emerged from the qualitative analysis: 1) An increase in anger over the first two observations followed by a slight decrease in anger on the last observation (see Figure 1), 2) exhibiting passive angry reactions, 3) exhibiting active angry reactions, 4) exhibiting aggressive angry reactions.

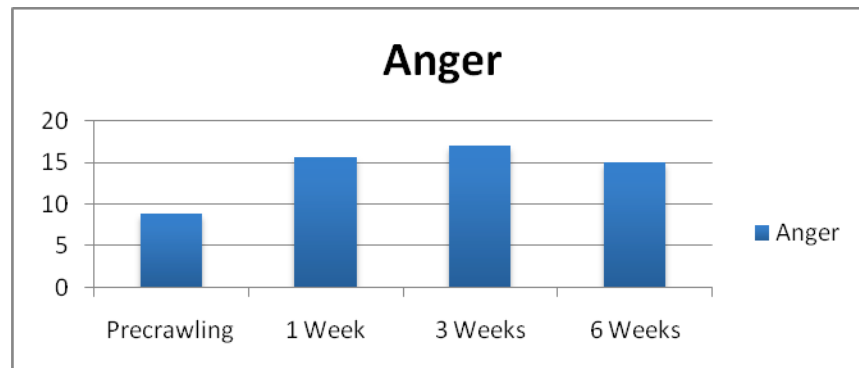


Figure 1: Trajectory of Anger for Case Studies

Theme 1: An increase in anger occurred after one week of crawling experience. The increase continued after approximately three weeks of crawling, then anger dropped slightly after six weeks of crawling experience.

Theme 2: Exhibiting passive angry behaviors involved the infants using reactive, self-soothing types of behaviors such as shutting their eyes for a period of time, making a sober expression, frowning, looking away, and thumb sucking.

Theme 3: Exhibiting active angry reactions involved exhibiting frustration through visible physical expressions or actions, such as increasing activity levels, flailing the arms and/or legs, fretting, and crying.

Theme 4: Exhibiting aggressive angry reactions involved the infants directing physical actions toward others, including reaching toward, moving toward, moving away, and struggling.

4. Discussion

The present investigation aimed to determine if there are differences in anger in precrawlers and crawlers. After four weeks of experience with crawling, there were significant differences in mean anger scores between two groups of crawlers and precrawlers with age and gender matched. The longitudinal, cross-case analysis revealed that infant anger increased in intensity after the infants initially gained experience with crawling experience, increased again on the second observation and declined slightly on the final observation. The rise in anger that occurred during the observations that took place after one and three weeks of crawling is consistent with research by Campos, et al. (1992) and Barrett and Campos (1987) that revealed an increase in emotionality after the onset of crawling. With the onset of locomotion, infants are likely to explore novel contexts and encounter potential hazards (Bai & Bertenthal, 1992). This exploration may lead to the discovery of objects that are not safe, such as electrical outlets, glass, and small or sharp objects. Consequently, the infant is more likely to be cautioned, warned, or reprimanded by a caregiver using a fearful, distraught, or angry tone (Biringen, Emde, Campos, & Appelbaum, 1995). These frustrating situations have the potential to trigger an angry reaction in the infant. Gustafson (1984) suggested that as an infant's world expands, an enhanced awareness of and increased attentiveness to distant objects and events occurs. This premise was confirmed, because the crawling infants in our study did pursue their interests in distant peers, caregivers, objects, and events. With their newfound mobility, infants are exposed to new opportunities to act on their desires and attempt to fulfill new goals. This leads to more possibilities for those goals to be blocked or unfulfilled, which may explain the increase in anger after the onset of crawling. Mobility also allows infants to approach an out of reach peer, which leads to increased opportunities for social interaction. During these social interactions, a peer may block the infant's goal or a conflict may arise. Two examples of situations that induced anger from the SSD include the infant wanting

an item that a peer has and a peer taking a toy away.

Regarding behaviors associated with anger, moving toward the elicitor is a behavior of high intensity and based on the cross-cases analysis, this response increased after experience was gained with independent mobility. Not only did the crawlers approach more as compared to precrawlers, they reached toward others more, displayed more sober expressions and struggled with peers as compared to precrawlers.

Campos, Campos & Barrett (1989) propose that anger is elicited when a person tries to overcome an obstacle while attempting to attain a goal, and the obstacle in the current study situations was frequently a peer. Crawlers did not hesitate to move and reach toward the peer to grab an item of interest and were more likely than precrawlers to struggle for that item. This is consistent with the assertion by Izard (1977) that emotions emerge as they become adaptive for the infant. Angry behaviors such as reaching and struggling serve a purpose for the infant, allowing the retrieval of desired items. Note the following example. A peer took a toy from a precrawler. The precrawler demonstrated passive angry behaviors, such as looking hard at the peer. However, in a similar scenario between a precrawler and crawler, the crawler acted on the anger by demonstrating more aggressive angry behaviors.

Precrawler. A peer reaches for a toy that the precrawler is holding. The precrawler looks hard at the peer with a sober expression. The peer takes them toy away, and the precrawler looks away, mouths his fist, and doesn't look back.

Crawler. The crawler is playing with a toy, and a peer grabs the toy and takes it away. The crawler looks hard the peer then stares at the toy. He reaches for the toy and moves toward his peer. He pauses and looks hard at the toy. He reaches for the toy, grabs it, and struggles to take the toy back. The peer won't let go of the toy, but the crawler pulls the toy again and retrieves it.

It is important to note that the anger observed in our study was frequently recorded during peer play and interactions. Peers pose natural challenges and obstacles that potentially lead to negative affect. The infants were observed struggling over toys and fretting when another peer received more attention. Based on our observations, social interactions play a role in the socio-emotional development that accompanies mobility in infancy. The findings of the present study are consistent with research based on maternal report demonstrating that crawling infants express anger more frequently and intensely that they did prior to independent mobility (Campos et al., 1992; Whitney & Green, 2011), and our study reveals that angry behaviors often occur during social interaction. There are several possibilities for the slight drop in anger during the final longitudinal observation. After a period of experience with mobility, the infants may have learned to deal with the frustration that initially experienced when their goals were blocked or not attained, thus demonstrating fewer angry reactions. It is also possible that with time, they learned to temper their engagement in conflict with peers based on prohibitive feedback provided by caregivers.

There were a number of limitations to this study. One limitation is that the SSD measures only eight situations throughout the day. However, the longitudinal observations addressed this limitation to an extent by complementing the SSD with descriptions of all angry expressions and behaviors for the three cases in a variety of situations. Another limitation is that the observations included minimal parent-child interactions. The observer was only able to document the parents and children interacting during drop off and pick up. A third limitation is that attachment style and cultural influences were not accounted for in the present investigation. Future studies should consider the role that attachment style and cultural influences play in anger development as it relates to crawling acquisition. The results of the current study support the premise that the experience of independent crawling is related to a typically developing infant's emotions of anger. Additional research is needed on infant mobility and its relationship to emotional expression in a naturalistic environment that include opportunities for social interaction. Future investigations will improve our understanding of the relationship between crawling and emotional development.

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