

# Ensuring Safety and Providing Challenge: Mothers' and Fathers' Expectations and Choices About Infant Locomotion

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## SYNOPSIS

**Objective.** We examined how parents' expectations about their infants' crawling ability and crawling attempts in a locomotor task affect parenting choices about ensuring infants' safety and providing appropriate challenges. **Design.** Mothers and fathers of 34 11-month-old infants adjusted a ramp to the steepest slopes they thought their infants could safely crawl down, would attempt to crawl down, and they would allow their infants to crawl down independently. **Results.** Most parents expected their infants to attempt slopes that were steeper than their ability and generally emphasized safety only by permitting infants to crawl down slopes that were within infants' expected ability. More fathers than mothers displayed parenting choices emphasizing challenge by allowing their infants to attempt slopes beyond their ability. **Conclusions.** Both mothers and fathers expected infants to attempt impossibly steep slopes, but mothers were more likely to adopt safety-oriented parenting choices. Wide disagreements within dyads and inconsistencies in individual parents' estimates might increase the chances of infants incurring injuries.

## INTRODUCTION

Parents play a central role in their infants' motor skill acquisition by cheering infants' first wobbly steps and guiding infants' attempts to climb stairs. Although developmentally advantageous, new skills — especially locomotor skills — also bring danger. Accidents are the leading cause of injury and death in children between 1 and 4 years of age (Hoyert, Heron, Murphy, & Kung, 2005). In 2001, 8,250 infants under 2 were treated in emergency rooms for injuries resulting from falling off playground swings and crashing at the foot of slides (McDonald & Greene, 2003).

Despite mothers' and fathers' critical role in guiding infants' motor skill acquisition, researchers know little about parents' expectations of their infants' susceptibility for mishaps and parenting choices in potentially risky locomotor situations. We conceptualize parenting choices to lie along a continuum from ensuring infants' safety to challenging infants to attempt new motor tasks. Parents who excessively limit their infants' actions might hinder infants' motor progress, whereas those who provide too much freedom might inadvertently expose their infants to danger.

Parents ensure safety by limiting infants to activities within their abilities and using electrical outlet covers, gates, barriers, and locks. In fact, mothers report that a large proportion of their verbal prohibitions are intended to keep infants safe (Gralinski & Kopp, 1993). Research also suggests that parents challenge infants to engage in tasks beyond their ability in an effort to promote motor skill development. For example, mothers encourage infants to walk up and down stairs instead of being carried (Gralinski & Kopp, 1993).

### Parents' Expectations of Infants' Abilities and Motor Risk-Taking

A variety of factors might influence parents' choices to adopt strategies that emphasize safety or challenge. First, parents might base their choices about the safety of new motor tasks on infants' abilities, or what they believe their infants could handle independently. If so, parents should be more likely to allow their infants to attempt potentially risky tasks if they believe that their infants have the requisite skills to handle the challenge.

Second, the basis for parenting choices might include parents' expectations about their infants' *motor risk-taking* — that is, what parents believe their infants would attempt to do vis-à-vis the limits of their abilities. Parents might expect their infants to place themselves in harm's way by attempting feats beyond their abilities. For example, mothers of 11-month-old crawlers expected their infants to attempt slopes that were steeper than they could safely navigate (Mondschein, Adolph, & Tamis-LeMonda, 2000). Some mothers expected their infants to engage in activities where they might fall and break bones or incur head injuries (Glik, Kronenfeld, & Jackson, 1993). Expecting the worst might lead parents to adopt a safety oriented strategy.

Alternatively, parents might expect their infants to constrain their attempts to situations within their abilities. In laboratory settings, experienced crawling and walking infants avoid obstacles that are beyond their ability; they closely match their attempts to crawl or walk to their motor abilities (Adolph, 1997, 2000; Mondschein et al., 2000). If parents are aware that experienced infants accurately appraise potential risks for themselves, parents might characterize their infants' decisions as conservative, and consequently permit their infants more latitude on risky motor tasks.

## This Study

In our study, we investigated mothers' and fathers' expectations and parenting choices about their 11-month-old infants' crawling behaviors on slopes of varying degrees. We focused on slopes because playground slides, wheelchair ramps, sloping drives, and hills are common in infants' everyday environments and are likely to involve parental supervision.

We first compared mothers to fathers at the group level on the safety – challenge continuum and asked whether parents' responses differed for girls versus boys. Previous research has suggested that fathers are more likely than mothers to permit their infants to engage in tasks beyond their ability. For example, when mothers and fathers viewed photographs of young children engaging in risky actions, fathers were less likely to report that they would stop children's risky actions (Fagot, Kronsberg, & MacGregor, 1985), perhaps because fathers believe that injuries are a natural consequence of childhood (Morrongiello & Dawber, 1999). Fathers also take more physical risks with their children, such as wrestling with children or tossing them in the air (MacDonald & Parke, 1986). However, previous research is inconclusive as to whether infants' gender is consistently related to parents' treatment of infants' motor activity. In one study, mothers were equally supportive of their sons' and daughters' physical activity, and fathers were more supportive of their sons' physical activity (Tauber, 1979). In another study, mothers expected higher levels of crawling ability and risk-taking in their 11-month-olds sons than their daughters, although sons and daughters displayed equivalent crawling ability and risk-taking (Mondschein et al., 2000).

Second, we examined both intra- and interparent consistency in parenting choices and expectations. Do parents reproduce the same judgments across multiple trials in the same task? Do mothers and fathers of the same infant share the same safety – challenge strategies and expectations about their infants? Mothers and fathers of the same infant might also differ in their assessment of their infants' abilities and their emphasis of safety versus challenge. Finally, we examined how parenting choices relate to expectations regarding infants' motor abilities and risk-taking.

## METHODS

### Participants

Thirty-four mother – father pairs (15 parents of girls, 19 parents of boys) from New York City were recruited via purchased mailing lists. Twenty-five couples were first-time parents, 32 mothers and 32 fathers had at least a college degree. Families reported their ethnicity as European American

(85%), African American (1%), Asian American (1%), Other (9%), and unreported (4%). All fathers and 20 mothers worked outside the home. The average age for fathers was 37.65 years ( $SD = 6.97$ ) and for mothers was 35.04 years ( $SD = 4.05$ ). Parents were tested when their infants were 11 months old ( $M = 11.18$  mos.,  $SD = .23$ ). All infants could crawl at least 3 m on their hands and knees and could not take independent walking steps. All but 2 infants (1 girl, 1 boy) were born at term. Through a structured interview with an experimenter, parents reported infants' crawling experience as ranging from .23 to 5.16 months ( $M = 2.48$ ).

### Sloping Ramp

We used the same sloping ramp used by Mondschein et al. (2000) to ask parents about their expectations and parenting choices. The apparatus had flat starting and landing platforms connected by piano hinges to a center sloping platform (each 86 cm wide  $\times$  91 cm long). The starting platform remained stationary at 116 cm high; the height of the landing platform adjusted from 116 cm to 25 cm using a push-button remote (see Figure 1). As the landing platform lowered, the slant of the middle section varied from  $0^\circ$  to  $90^\circ$  in  $1^\circ$  increments. Carpet covered the surface of the ramp and netting lined the sides. A protractor on the far side of the ramp (hidden from parents' view) indicated the degree of slant.

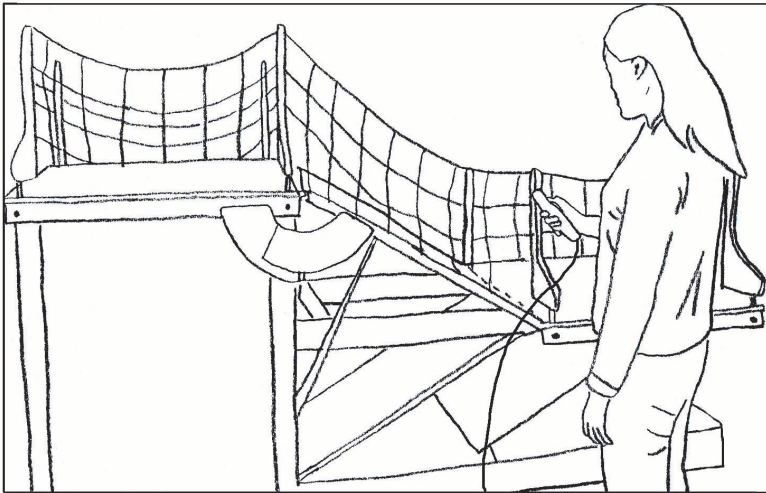


FIGURE 1

Adjustable sloping ramp. Parents adjusted the degree of slant via a hand held remote while viewing the ramp from the top, bottom, or side.

## Procedure

During a single visit to the laboratory, mothers and fathers independently set the sloping ramp in response to probes. When one parent was being tested, the other waited in a different room. After watching the experimenter demonstrate how to operate the push-button remote, parents practiced adjusting the slant of the ramp and were free to view the ramp from different angles. The parents' task was to adjust the slant of the ramp in response to each of three questions: "What is the steepest slope your baby can successfully crawl down in his or her normal crawling position?" (*expectation of crawling ability*), "What is the steepest slope your baby would try to crawl down in his or her normal crawling position even if he or she fell?" (*expectation of crawling attempts*), and "What is the steepest slope you would permit your baby to crawl down on his or her own if you were all the way across the room?" (*parent permission level*). Parents were instructed to imagine their infants poised in their crawling posture, alone at the edge of the starting platform facing down the slope. Parents answered each question four times (slope started at 0° for first and third trials and 90° for second and fourth trials) for a total of 12 trials, with trials blocked by question. The experimenter recorded parents' responses on-line, using the hidden protractor. The order of crawling ability and crawling attempt questions were counterbalanced, and the permission question was always asked last.

## RESULTS

We calculated parents' expectations of infants' crawling ability, crawling attempts, and parents' permission level by averaging the four responses for each question (see Figure 2). A 2 (parent gender)  $\times$  2 (child gender)  $\times$  3 (question) ANOVA yielded a main effect for question,  $F(2, 64) = 33.70, p < .001$ . Average crawling ability was 23.87° ( $SD = 7.14$ ), crawling attempt was 37.18° ( $SD = 15.75$ ), and permission level was 21.90° ( $SD = 6.85$ ). Post hoc  $t$  tests indicated that parents' permission levels were lower than their expectations of both infants' crawling ability and crawling attempts; parents' expectations of infants' crawling attempts were higher than expectations about crawling ability (all  $ps < .05$ ).

### Parenting Choices Along the Safety – Challenge Continuum

In response to the question regarding the safety – challenge continuum, post hoc tests revealed that parents respond on the side of safety. To further explore this tendency, crawling ability was subtracted from permission level to obtain a *parenting choice* value. As shown in Figure 3, positive

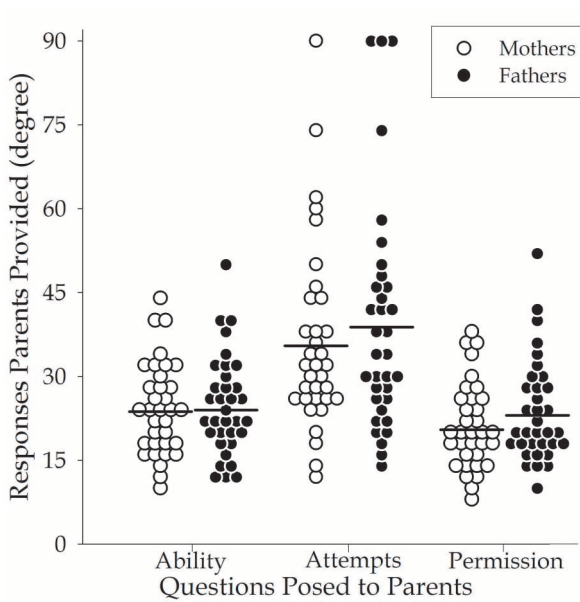
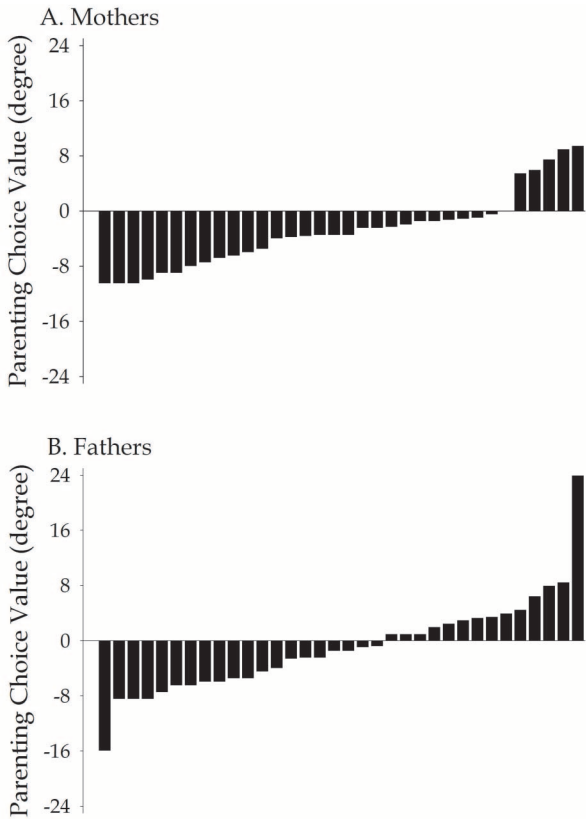


FIGURE 2

Mothers' and fathers' responses for each question. Circles represent responses for individual parents. Horizontal line denotes mean value for mothers and fathers, respectively, for each question.

parenting choice values indicated that parents would permit their infants to crawl down slopes beyond their expected ability (emphasizing challenge). Negative values indicated that parents would permit their infants to crawl down slopes within their infants' expected ability (emphasizing safety). Mothers' ( $M = -2.96^\circ$ ,  $SD = 5.43$ ) and fathers' ( $M = -.98^\circ$ ,  $SD = 6.99$ ) parenting choice values indicated that they would emphasize safety, but values were only slightly negative, suggesting that parents would allow infants to attempt slopes that were close (on average) to their infants' expected ability. A 2 (parent gender)  $\times$  2 (child gender) ANOVA on parenting choice value revealed differences based on child gender,  $F(1, 32) = 5.16$ ,  $p < .05$ . Parents of boys ( $M = -3.43^\circ$ ,  $SD = 4.26$ ) stressed safety more than parents of girls ( $M = -.11^\circ$ ,  $SD = 4.22$ ). Additionally, a greater percentage of fathers (41.2%;  $n = 14$ ) than mothers (14.7%;  $n = 5$ ) would challenge their infants to descend slopes beyond their expected ability,  $\chi^2(1, N = 68) = 5.92$ ,  $p < .05$ .

The second set of questions addressed intra- and interparent consistency. We examined intraparent consistency by determining whether parents are able to reproduce the same responses over multiple trials for each original question. We computed the coefficient of variation by dividing the



**FIGURE 3**

Parenting choice values for (A) mothers and (B) fathers based on subtracting permission scores from expectation of infants' ability. Each bar represents the parenting choice value from one parent.

mean value of the four probes by the standard deviation. Generally, values less than .10 are considered to reflect reliable responses. A 2 (parent gender)  $\times$  2 (child gender)  $\times$  3 (question type) repeated-measures ANOVA on the coefficient of variation revealed no differences. Average values for each question were close to .10, suggesting relatively consistent responses ( $M_s = .12, .11, \text{ and } .11$  for crawling ability, crawling attempts, and permission level, respectively).

We next examined intraparent consistency of mothers' and fathers' responses across the four trials for each question by counting the number of trials on which parents might inadvertently allow their infants on slopes beyond their abilities. That is, even if parents aim for a small safety margin,

they might occasionally err on the side of risk due to variability in their assessment of the degree of slant. Although on average 76.6% of parenting choices emphasized safety, 55.9% ( $n = 19$ ) of mothers and 61.8% ( $n = 21$ ) of fathers evidenced 1 or more trials with a challenge strategy (i.e., where permission levels were higher than estimates of infant ability). Moreover, paired  $t$  tests showed that parents' responses to all three questions were higher when the starting position of the sloping ramp was set to 90° than when it was set to 0° (all  $ps < .01$ ).

Do mothers and fathers of the same infant agree on a safety – challenge strategy? For 17 of the 34 dyads tested, both parents emphasized safety and for 2 dyads, both parents emphasized challenge. For 12 dyads, mothers emphasized safety and fathers emphasized challenge. The opposite pattern was obtained for the remaining 3 dyads. The lack of agreement between mothers and fathers was also reflected in the low correlation between mothers' and fathers' parenting choice scores,  $r(34) = .04$ ,  $ns$ .

#### Parents' Expectations of Infant Motor Risk-Taking: Relations to Parenting Choices

The final set of analyses explored whether mothers' and fathers' permission responses were related to their expectations of infants' crawling ability, crawling attempts, and motor risk-taking. For these analyses, expected crawling ability was subtracted from crawling attempts to obtain an *infant risk taking* value. A 2 (parent gender)  $\times$  2 (child gender) ANOVA on infant risk taking revealed no differences. The majority of parents expected their infants to crawl down slopes far beyond their expected ability ( $M = 13.31^\circ$ ,  $SD = 12.74$ ; see Figure 4). Specifically, 91.2% ( $n = 31$ ) of mothers and 88.2% ( $n = 30$ ) of fathers expected their infants to crawl down slopes that were 2° or more beyond those they thought infants could safely navigate. One mother and three fathers expected their infants to attempt a sheer drop-off of 90° (see Figure 1).

We compared the contributions of various factors to parents' permission levels in a hierarchical regression analysis by entering variables sequentially in blocks. In the first block, we entered parents' gender and infants' birth order and gender. These variables explained only 15% of the variance (total  $R^2 = .15$ ). After controlling for gender, we entered infants' crawling ability and infants' motor risk-taking in the second block (total  $R^2 = .76$ ,  $\Delta R^2 = .55$ ). With all of the variables entered into the model, only crawling ability was associated with permission levels ( $B = .79$ ,  $p < .001$ ). Parents who expected their infants to be more capable crawlers would permit their infants to independently crawl down steeper slopes.



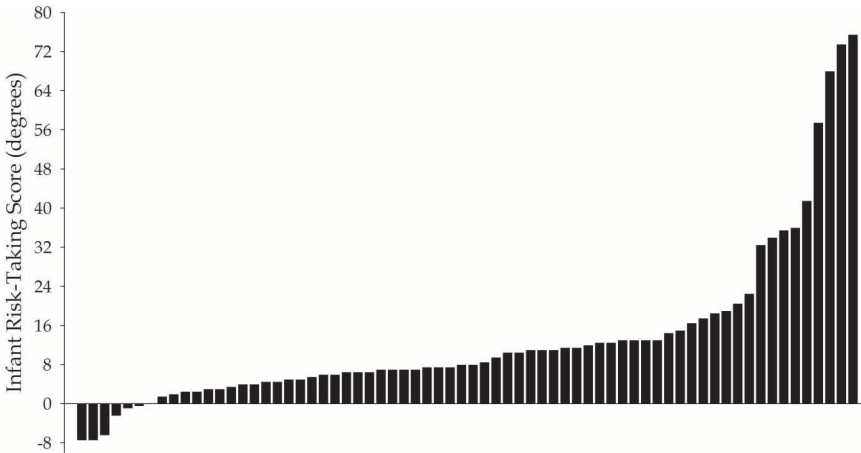


FIGURE 4

Parents' expectations of infants' risk-taking for all subjects, based on subtracting infants' expected attempts from infants' expected ability. Each bar represents the expected infant risk-taking value of one parent.

Last, we examined the relation between parenting choices and expectations of infants' motor risk-taking. Parents' safety – challenge choices were not associated with the extent of motor risk-taking they expected in their infants,  $r(34) = .23$ , *ns*, for mothers and  $r(34) = -.29$ , *ns*, for fathers. The lack of significance for these associations may be due to limited power.

## DISCUSSION

This study examined mothers' and fathers' parenting choices and their expectations of their infants' crawling behaviors and motor risk taking. On a daily basis, parents must quickly determine whether their infants have sufficient motor ability to successfully navigate potentially risky tasks and whether their infants will make accurate motor decisions or place themselves in harm's way.

Overall, 70% of parents displayed safety oriented parenting choices: Parents would limit their infants' unaided attempts to slopes shallower than what they expected their infants could safely crawl down. However, parenting choices lie along a continuum. Nearly all parents' (92.6%) permission levels were within  $10^\circ$  of infants' expected crawling abilities in either direction. Most safety-oriented mothers and fathers maintained only a small margin of safety and most of the challenge-oriented parents allowed

only a small level of risk. Therefore, infants might occasionally fall while monitored under parents' minimal safety regime and might occasionally succeed under parents' minimal risk regime. These ability-based parenting choices strike a balance between reducing the likelihood of accidents in the context of promoting infants' locomotor development. Parents do believe that children should engage in some behaviors that might be considered slightly risky as part of development (Tomlinson & Sainsbury, 2004), but maintain a small safety margin to counter the frequency of mishaps.

As parents' choices move along the challenge side of the continuum, beyond a certain point parents might be better viewed as encouraging dangerous actions in their infants. However, even among the 19 parents who made choices that were referred to as challenging, 18 would only allow their infants to attempt slopes that averaged  $4.8^\circ$  steeper than what their infants could safely handle. Only one parent (a father) selected slopes that were  $24^\circ$  steeper (on average) than his infant could safely crawl down, thereby qualifying as encouraging danger. It therefore appears that parents' choices are rarely extreme, but rather approximate their infants' abilities even when parents emphasize challenge.

The findings of this study suggest that "scaffolding" is domain specific: Parents are likely to limit infants' behaviors and respond with caution when the consequences of overestimating infants' abilities can be costly. The tendency to limit infants to activities within their ability contrasts with parenting strategies in other domains, such as language or play, where parents challenge their infants by encouraging performance at levels beyond their current abilities (Damast, Tamis-LeMonda, & Bornstein, 1996). Infants are unlikely to incur injuries if parents challenge them to play or talk beyond their abilities; in fact, infants may benefit from these solicitations.

The finding that fathers were more likely than mothers to adopt a challenge orientation concurs with and advances previous research (Fagot et al., 1985). These results might reflect fathers' rough and tumble interaction style or willingness to take greater risks with their infants. Fathers may believe that, despite the risk of injury, infants' motor competencies may be enhanced by engaging in difficult motor tasks (Lewis, DiLillo, & Peterson, 2004).

Mothers and fathers both believed that sons and daughters would attempt slopes that were too steep for safe crawling. In contrast to Mondschlein et al. (2000), we did not find higher levels of expected risk taking for boys than for girls. Rather, parents of boys and girls were in nearly uniform agreement about their infants' levels of risk taking. A potential reason for the contrasting results between the two studies may be the difference in design. Mondschlein et al. (2000) only asked mothers about their expecta-

tions regarding their infants' behaviors. Our study is the first to focus on parents' choices in potentially risky motor situations.

Nonetheless, parents' expectations in this study and in the Mondschein et al. (2000) study contrast with experienced crawlers' actual behaviors on the same apparatus. In fact, 11-month-old crawlers are unlikely to attempt slopes beyond their ability (Fraisie, Couet, Bellanca, & Adolph, 2001); their motor risk taking is closely aligned with the likelihood of success. Nevertheless, by upholding a working model in which infants are expected to engage in risky behaviors, parents might adjust their own behaviors to accommodate this belief.

In light of parents' overall safety strategy, what might account for the reported high rates of injury to young infants? Several aspects of parenting are likely candidates. A number of parents, especially fathers, exhibited choices that could be categorized as potentially dangerous supervision by allowing their infants to crawl down slopes beyond their expected ability. Moreover, parents were inconsistent when their responses were classified as oriented toward safety versus challenge, vacillating between the two from trial to trial. And even though mothers and fathers based their expectations on the same infant in the same task, responses were unrelated and inconsistent within dyads. Thus, infants may receive dramatically different levels of parental supervision depending on the vicissitudes of individual parents' responses and on which parent cares for them. Future research on injury prevention should consider that parents sometimes make inconsistent choices and that mothers and fathers may respond differently to the same situation. Additionally, research on fathers' and mothers' expectations and choices about infant safety should be conducted in larger samples of families from a range of socioeconomic strata so as to test the generalizability of findings to different populations.

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