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Toddler Emotion Regulation with Mothers and Fathers: Temporal Associations Between Negative Affect and Behavioral Strategies

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Abstract

The present study investigated temporal associations between putative emotion regulation strategies and negative affect in 20-month-old toddlers. Toddlers' parent-focused, self-distraction, and toy-focused strategies, as well as negative affect, were rated on a second-by-second basis during laboratory parent-toddler interactions. Longitudinal mixed-effects models were conducted to determine the degree to which behavioral strategy use predicts subsequent negative affect and negative affect predicts subsequent strategy use. Results with mother-toddler and father-toddler dyads indicated that parent-focused strategies with an unresponsive parent were followed by increases in negative affect, whereas toy-focused strategies were followed by decreases in negative affect. Results also indicated that toddler negative affect serves to regulate behavioral strategy use within both parent contexts.

The topic of emotion regulation has received increasing attention in the past two decades. Despite considerable agreement that effectively regulating emotions is a hallmark of early socioemotional development (Kopp, 1989; Tronick, 1989), conceptual and methodological challenges have impeded our understanding of emotion regulation (Cole, Martin, & Dennis, 2004). Cole et al. (2004) called on researchers to adopt the following strategies: (a) provide a working definition of emotion regulation, (b) engage in independent assessment of emotion and putative regulatory strategies, (c) analyze temporal relations between emotion and putative regulatory strategies, (d) compare emotion and putative regulatory strategies in a variety of contexts, and (e) use multiple, converging measures. In light of these suggestions, the current study, using a sample of toddlers aged 20-months and their parents who participated in a mildly frustrating situation, addressed several important issues related to these challenges: (a) the temporal relations between negative affect and behavioral strategies, and (b) the consistency of temporal relations in two social contexts: mother versus father.

Although there is variation in how emotion regulation is conceptualized, most definitions of emotion regulation include aspects surrounding a person's ability to monitor, evaluate, and modify emotional reactions, including intensive and temporal features, to accomplish one's goals (Cole et al., 2004; Kopp, 1989; Thompson, 1994). This definition refers to emotion as being regulated. For example, infants and children may use behavioral strategies in an effort to decrease the intensity of negative affect (Thompson, 1994). Although strategies can be employed to modulate positive affect in addition to negative affect (Stifter & Moyer, 1991), our study focused on the reduction of negative affect during a mildly frustrating situation. In addition to putative strategies regulating affect, it is also possible that the emotion can serve to regulate the behavioral strategies that are performed (Thompson, 1994). For example, extremely intense feelings of frustration may prohibit the child from being able to use certain behavioral strategies that would otherwise be available if s/he had been less frustrated. Thus, it is important to examine the direction of effects between affective responses and putative regulatory behaviors when studying regulatory processes. Thus, another goal of the present study was to examine the reciprocal relations between negative affect and behavioral strategies.

In general, there are three broad categories of behavioral strategies that toddlers have used: (1) other-focused, which includes any attempt to engage the parent or another individual; (2) object (toy)-focused, which generally includes any behaviors directed at an object; and (3) self-distraction, which can include strategies such as self-soothing, gaze aversion, and motor activity not directed at the parent or an object (e.g., Stifter & Braungart, 1995). Each of these strategies may help toddlers deal with negative feelings. For example, in situations where toddlers feel frustrated, they may use other-focused strategies to get more information (e.g., social referencing) or to solicit help from. Object (toy)-focused strategies may reflect toddlers' attempts to problem-solve and change their current situation when that object is the source of their frustration. Self-distraction allows toddlers to redirect their attention away from the source of frustration, indicating a form of avoidance (Braungart-Rieker, Garwood, Powers, & Wang, 2001).

When observing toddlers, it appears that some strategies seem to be more effective at reducing negative affect, whereas other strategies are associated with increased negative affect. Few studies, however, have systematically studied the degree to which these types of strategies are effective at reducing negative affect. Rather, many studies assume that the displays of such strategies are indeed serving a regulatory function. Thus, the present study examines temporal patterns of strategy use and negative affect to test the degree to which certain strategies may be more effective than others in reducing negative affect.

Understanding the Temporal Relations Between Emotion and Behavioral Strategies

To date, the majority of research investigating infant and toddler emotion regulation has generally relied on correlational associations between emotional expressions and behavioral strategy use that are occurring at the same time, and have not looked at the possible temporal relations between the variables. Cole et al. (2004) argue that examining the temporal relations between variables is a critical way to demonstrate regulatory processes. For example, when a toddler performs a behavioral strategy, what happens to the toddler's emotional expression immediately after the use of this strategy? If a behavioral strategy is indeed a regulatory strategy, one would expect to see a decrease in negative affect following that performance.

Several studies have used contingency analyses to determine if putative regulatory behavioral strategies are in fact associated with a decrease in negative affect. For example, Stifter and Braungart (1995) assessed affect and behavioral strategies among 5- and 10-month-old infants. Infant affect was coded in 10-s epochs and a change score was calculated

from one epoch to the next. Results indicated that self-distraction and object-focused strategies were more likely to occur when negative affect was decreasing. Using similar analyses, Buss and Goldsmith (1998) examined presumed regulatory strategies of 6-, 12-, and 18-month-olds in two emotion-eliciting contexts: fear and anger. Infants' emotional expression and behavioral strategies were coded in 5 and 10-s epochs, and a change score for the intensity of emotional expression from one epoch to the next was calculated. Results indicated that each of the behavioral strategies in the anger-eliciting context (object-focused, parent-focused, and self-distraction) was followed by a reduction in anger.

Additionally, Diener and Mangelsdorf (1999) examined putative regulatory behaviors of 18- and 24-month-old toddlers in four different contexts: mother-involved, mother-constrained, anger-eliciting, and fear-eliciting. Toddlers' emotional expressions and regulatory strategies were coded in 15-s intervals. Contingency analyses, using change scores, were conducted and indicated that not all behavioral strategies served to reduce negative affect. For example, some object (toy)-focused strategies (e.g., focus on object in room) maintained but did not reduce anger intensity. However, the parent-focused strategy of fussing to the mother was associated with decreases in anger levels. It is important to note that although mothers were constrained during the contexts they were able to respond to the child if the child made a bid.

Finally, Crockenberg and Leerkes (2004) examined relations between emotion and putative regulatory behaviors with a novel toy in 6-month-old infants using sequential analyses. Emotional expressions and behavioral strategies were coded on a continuous basis, and sequential analyses were conducted to determine the probability of decreases, maintenance, and increases in negative affect as a function of each behavioral strategy. Results indicated that infants' use of a variety of self-distraction strategies, including self-soothing and looking away from the novel toy, were associated with a decline in negative affect. Taken together, results from these studies involving an examination of changes in negative affect following the displays of parent-focused, object-focused, and self-distraction indicated that some of these behaviors seem to serve a regulatory function of reducing negative affect at least some of the time, and that child age and the context during which emotions are elicited can affect the degree to which a behavior is reducing negative affect. It should also be noted that the efficacy of behavioral strategies is likely to be influenced by a number of factors, such as the context, child characteristics, and even the family environment.

Each of the studies examining the temporal relationship between behavioral strategies and negative affect presume that emotion is being regulated by the child's behaviors. Another possibility-- one that is not typically studied-- is that emotion can also serve to regulate the behaviors being performed. For example, it is possible that toddlers choose to look around the room and distract themselves because they are experiencing distress. It is also possible that greater levels of distress may actually inhibit the use of specific behaviors. Because this direction of effects has not been frequently studied, and not studied at all with respect to negative affect, we have conducted exploratory analyses to begin to unravel these complex relations and encourage further discussion.

The purpose of the current study was to identify which putative regulatory behaviors are associated with increases or decreases in negative affect following the performance of the behavioral strategy. In the current study we have used techniques to manipulate the data that allow us to address these important questions. Previous researchers have chosen to analyze contingencies specifying only one time epoch (e.g., 1-s, 5-s, or 10-s) and have utilized these various epochs at different ages. It is possible, however, that processing speeds increase with age (see Rose, Feldman, & Jankowski, 2002). Therefore, the time epochs chosen to perform contingency analyses in younger children may not be adequate for older children. In

addition, relying on longer epochs, such as 10-s and 15-s, may cause researchers to miss important patterns that might occur at much shorter intervals. By using various lags (1 to 5-s) we can test for both fleeting and more delayed changes in negative affect as a function of performing a specific behavioral strategy. Thus, if toddlers' affect becomes less negative following a specific behavioral strategy, we are able to infer that the strategy is serving an effective regulatory purpose. In addition, we examine the degree to which patterns between negative affect and regulatory strategies are consistent across parent-toddler contexts, in other words, whether the patterns look the same when toddlers are with mothers as they do when toddlers are with fathers.

The Role of Fathers

The importance of the role that fathers may play in their children's social and emotional development has received increasing attention (e.g. Parke, 2004). Studies involving both mothers and fathers have found that fathers typically use more tactile stimulation and interact with their child in a more playful manner than mothers do (Parke & Tinsley, 1987). During times of distress infants turn to mothers for comfort, whereas during times of play infants prefer fathers (Lamb, Frodi, Hwang, & Frodi, 1982). Despite these differences, several studies have found that mothers and fathers are, on average, equally sensitive and there is a range in the levels of sensitivity expressed within both mother and fathers groups (Braungart-Rieker, Garwood, Powers, & Notaro, 1998; Diener, Mangelsdorf, McHale, & Frosch, 2002). Overall, mothers and fathers may play different roles during their toddler's development and it is important to understand whether these different relationships influence toddler's behaviors.

Despite this recognition, only a small portion of what we know about the influence of caregivers on young children's emotion regulation has come from comparing father-child dyads to mother-child dyads. Bridges and Connell (1991) examined consistencies in infant behavior and emotion across parent-infant interactions in a distressing context, the strange situation (Ainsworth, Blehar, Waters, & Wall, 1978) and a non-distressing free play episode. Cross-parent consistencies in both emotion and parent-focused strategies were found for the distressing episode, but not for the non-distressing episode. In addition, cross-parent consistency of infants' emotion and behavioral strategy has been examined in two other contexts: a parent-active delay, where the parent could interact with the child, and a parent-passive delay that was expected to elicit more distress because the parent could not interact with the infant (Bridges, Grolnick, & Connell, 1997). Similar to their earlier study, Bridges et al. (1997) found cross-parent consistency in emotion for the more distressing parent-passive delay situation as compared to the parent-active delay. Cross-parent consistency in behavioral strategies also differed across contexts such that passive engagement was consistent during the parent-active situation, whereas parent-focused strategies were consistent across the parent-passive situation. Thus, results from these two studies suggest that the use of emotion regulation strategies appear to be affected by both the emotional context (distressing vs. non-distressing) and by differences in the social context (mother vs. father).

Cross-parent differences in the use of emotion regulation strategies may occur for several reasons. For example, Braungart-Rieker et al. (1998) found that 4-month-old infants displayed more object orientation with mothers and more parent orientation with fathers during the Still-Face Paradigm (Tronick, Als, Adamson, Wise, & Brazelton, 1978) in which parents cease interacting with their infants. These differences in strategy use may be related to the differential amount of time that infants generally spend with their mothers versus their fathers during these early months. In this case, infants may have greater expectations for maternal behavior. In low-risk situations it is generally acknowledged that maternal responses are supportive in nature (Braungart-Rieker et al., 1998). Thus, the lack of maternal

responding during the ignore portion of the still-face may be interpreted by the infant as unexpected and therefore a greater source of distress than the lack of paternal responding. Further, Parke (1994) suggests that the paternal impact on emotion regulation may be different from the maternal impact because fathers provide children with more opportunities to learn and practice emotion regulation strategies during times of high arousal (e.g., rough and tumble play). Therefore, although it is possible that infants develop a repertoire of behavioral strategies that they consistently use in specific emotion-eliciting situations, it is also possible that the use of behavioral strategies varies as a function of the social context. The current study observes toddler behaviors in two mildly frustrating social contexts – one with mother and one with the father - in order to examine the degree of consistency in negative affect, behavioral strategy use, and the temporal relations between negative affect and putative strategy use.

Based on the current state of the literature concerning the effects of behavioral strategies on toddlers' negative affect, the present study has multiple goals. The purpose of the current study was to identify behavioral strategies that toddlers use during a mildly frustrating situation that was designed to be similar to everyday events that toddlers might experience. More specifically, toddlers were given a toy that was difficult to operate in the presence of their unresponsive parent. In this paradigm both the toy and the unresponsive serve as potential sources of frustration. We are interested in identifying the behavioral strategies that are associated with both decreases and increases in negative affect. Similar to other research, our study will focus on the putative regulatory strategies of parent-focused, self-distraction, and object (toy)-focused behaviors (e.g., Buss & Goldsmith, 1998). We are also interested in exploring whether relations between negative affect and possible regulatory behaviors are similar in two different social contexts: mother versus father. This allows us to examine whether processes are consistent across contexts or are specific to the parent with whom the toddler is interacting and with whom they may have a unique relationship. Finally, we are exploring the reciprocal relation between negative affect and behavioral strategies. In other words, it is possible that affect is regulating the performance of behavioral strategies in addition to or instead of negative affect being regulated by certain behaviors.

Hypotheses

In the current study, we tested the following hypotheses:

1. Due to the mother's lack of responding, which is a potential source of distress, we expect that mother-focused behavioral strategies, such as looking at the mother, will lead to an increase in negative affect. Given the dearth of research on toddlers' strategies with fathers and their relation to affect, we will explore the extent to which these relations are similar during father-toddler situations.
2. With mothers, self-distraction strategies will be associated with reduced negative affect. Although there is considerably less research with fathers, we also expect that these strategies will be associated with reduced negative affect during father-toddler interactions.
3. We will explore the extent to which toy-focused strategies are associated with increases or decreases in negative affect. It is possible that a difficult toy may become a source of distress if toddlers are unable to operate it, and would therefore be associated with an increase in negative affect. Conversely, the toy may serve to distract the toddler from their unresponsive parent and, thus, be associated with decreases in negative affect.

4. Given the paucity of research on the reciprocal relation between emotion and putative regulatory strategies, we will also explore the degree to which negative affect might lead to changes in the use of regulatory behaviors.
5. We will also explore whether temporal relations between negative affect and behavioral strategies occur relatively immediately or in a more delayed manner.

Method

Participants

This study was part of a larger longitudinal study of 135 parents and their children. Participants were recruited through a variety of mechanisms: a local child birth educator announced the study to her classes, flyers were sent home to new mothers from a local hospital, business cards were distributed to various local community locations, and an informational booth was set up at several local community events. Families attended six laboratory visits when their infants were 3, 5, 7, 12, 14, and 20 (+/− 14 days) months of age. For the purpose of the present study, only data from the 20-month visit was used. Of the original 135 families who completed the first lab visit, 116 families returned for the 20 month lab visit, for a completion rate of 86%. In the current study, data from 106 mothers and 98 fathers were used. Seven of the mothers' data and eleven of the fathers' data were unable to be used due to equipment failure or the parent not following procedure correctly. Data from three additional mothers-toddler and one father-toddler dyad were removed from analyses because the toddler showed extreme fussiness that was unrelated to the procedure (i.e., toddler began fussing during the play episode of the paradigm and remained in that state throughout the paradigm).

In this sample, 52 toddlers were boys. The parents are predominantly Caucasian (93.7% of mothers and 91.0% of fathers) and middle class; 10.3% of the families had annual incomes below $29,999, 69.2% earned $30,000–$74,999, and 20.4% made $75,000 or more annually. Less than a quarter of parents had a high school degree or less (7.1% of mothers and 15.4% of fathers), over half of parents had some college or completed college (63% of mothers and 52.7% of fathers), and more than a quarter of parents had some postgraduate training or completed postgraduate training (29.7% of mothers and 31.8% of fathers). The age of the parents varied widely (mothers' and fathers' age range = 19–44). Families consisted primarily of married parents living together (90.1%) and unmarried parents living together (7.2%).

Procedure

Procedures for the visit took place in a large carpeted room that was furnished with several chairs, a high chair, and a table. The walls of the room were covered in a variety of child appropriate, colorful posters. Two video cameras positioned behind one-way mirrors located in different positions in the room, simultaneously recorded the assessments. One camera recorded the toddler's behavior while the second camera recorded the parent's behavior, and both recordings were fed into a split-screen generator that combined the images into one screen. When the parents and toddlers arrived for the 20-month visit, parents were informed of the procedures. Then, one parent was randomly selected to participate first, while the parent not participating waited in another room.

The Parent-Ignore-Toddler-Situation (PITS) was a newly developed procedure, which was developed for this study and is similar to the infant Still-Face Paradigm (Tronick et al., 1978). The PITS procedure consists of three 90-s structured episodes involving the toddler with each parent separately. Because toddlers participated in consecutive PITS sessions with mothers and fathers (2 PITS with 3 episodes each), the relatively brief length of the PITS

was chosen to prevent toddlers from becoming fatigued. A different toy was used with each parent, but the order of the toy was not counterbalanced. Thus, we will refer to each context as the mother- and father-context but it should be noted that the type of toy used was specific to the order in which the parent interacted with the toddler. The toddler was placed in the high chair so that s/he was unable to leave during the procedure. The parent sat in a chair perpendicular to the toddler. During the first 90-s episode (Play episode) parents were instructed to show their toddler an interesting mechanical toy. The toy – either a child's slide projector or a cassette player – was chosen to capture toddlers' interests but to be too difficult for toddlers to operate on their own. In the rare case that the toddler was very familiar with the toy (i.e., owned the toy) or in one case, was frightened by the toy, a TV/VCR was substituted (n=1 with mother; n=5 with father). It was never the case that more than one replacement toy was needed. Those that used the TV/VCR did not significantly differ from the other two toys on negative affect or behavioral strategy use. During the second 90-s episode (Ignore episode) parents were instructed to cease interaction, turn off the toy, but leave the toy within the child's reach, maintain a neutral expression, and read a magazine. If the toddler became too distressed, the episode was terminated and the final episode began; this occurred for two mother-toddler dyads and four father-toddler dyads. In the final 90-s episode (Play resume episode), the parent resumed interacting with his/her toddler and the mechanical toy. All dyads completed the play resume episode. Finally, the parent was allowed to remove the toddler from the chair. Data from the Ignore episode was used in the current study.

Measures

Toddler Behavioral Strategies—Toddlers' behavioral strategies during the Ignore episode of the PITS, designed to elicit frustration were coded. Strategies were rated from videotapes on a second-by-second basis using traditional paper and pencil methods. Based on behaviors coded in other studies of infant and toddler regulation (Buss & Goldsmith, 1998; Calkins & Johnson, 1998; Diener et al., 2002; Diener & Mangelsdorf, 1999; Nachmias, Gunnar, Mangelsdorf, Parritz, & Buss, 1996; Parritz, 1996) we coded 13 behavioral strategies that fit into one of three broad categories – *parent-focused*, *self-distraction*, or *toy-focused* strategies. Brief descriptions of the behaviors comprising these strategy types are provided in Table 1. All behaviors were coded on a presence/absence basis. Coders received extensive training using sample videotapes and did not code independently until they were reliable (Cohen's kappa ≥ .70) with a gold-standard coder. In addition, coders did not code the same toddler more than once (i.e., with mother and father) and reliability was calculated on approximately 25% of the videotapes using Cohen's kappas (see Table 1). The strategies of escape, high intensity motor behavior, and vocalizing to other parent were removed from further analyses due to a relatively low occurrence (less than 15% of the episode).

Parent-focused strategies included the sum of looking at the parent, gesturing to the parent, and talking to the parent (range = 0 – 3). *Self-distraction* included the sum of visual distraction, talking to self, and self-soothing (range = 0 – 3). *Toy-focused strategies* were defined as the degree of involvement with the toy, with a score of 1 representing passive play (to receive this score toddlers must be both looking away from the toy and either holding or passively engaged with toy), and a score of 2 representing active play (to receive this score toddlers must be both looking at the toy and actively engaged with the toy). These variables were created within each of the 90-s of the Ignore episode; therefore, each participant received a score at each second for each of the three regulatory strategies. For the purposes of descriptive statistics and preliminary correlation analyses we also created a composite score for each behavioral strategy by averaging these second-by-second scores across the 90-s Ignore episode.

Toddler Negative Affect—A team of coders, different from those who rated behavioral strategies, rated toddlers' affect during the Ignore episode of the PITS. Negative affect was coded from videotapes on a second-by-second basis, using a 4-point scale from 0 to 3, similar to previous studies (Braungart-Rieker et al., 1998). Scores indicated that the toddler was displaying negative affect such as distressing vocalizations which included screaming, crying, or fussing, and facial expressions such as frowning, grimacing, or furrowed brows. Expressions that were more intense were coded higher in negative affect. For example, a toddler who was slightly frowning or furrowing their brows would receive a score of 1, whereas a toddler who was intensely crying would receive a 3. A score of 0 indicated that the toddler displayed an expression that was not negative. Coders received extensive training using sample videotapes, and did not code independently until they were reliable (greater than 70% agreement) with a gold-standard coder. In addition, coders did not code the same toddler more than once and reliability was calculated on approximately 25% of the videotapes. Intraclass correlations were computed in order to assess the interrater agreement. The intraclass correlations were .93 and .85 for mother-toddler and father-toddler episodes, respectively.

Overview of Analysis Strategy

Because there are multiple observations for each toddler and some toddlers do not have equal numbers of observations, we used mixed effects modeling to account for missing data. This approach has the advantage of using all available data from a given toddler. We used the PROC MIXED procedure in SAS (Littell, Milliken, Stroup, & Wolfinger, 1996; Singer, 1998) to examine toddlers' subsequent negative affect or strategy use during the Ignore episode while controlling for current negative affect or strategy use. PROC MIXED assesses linear and nonlinear models and allows for the specification of covariance structures and estimation methods.

Due to a lack of research investigating associations between behavioral strategy use and negative affect on such a discrete level, we focused on temporal associations, specifically, those with a 1-s, 2-s, 3-s, 4-s, and 5-s lag. Previous research has shown an association between behavioral strategy use and negative affect using 5-sec increments (Braungart-Rieker et al., 1998)1. Therefore, we have chosen to conduct models for each second, up to and including a 5-sec lag. Behavioral strategies at second *t* are hypothesized to affect change in toddler negative affect from second *t* to second *t* + 1, second *t* + 2, second *t* +3, second *t* +4, and second *t* + 5. To rule out the possibility that any lagged effect of behavioral strategy on toddler negative affect might be an artifact of initial toddler negative affect, initial negative affect was included in the model as a control variable. In such a model the dependent variable can be interpreted as residualized change in toddler negative affect from second *t* to second *t* + 1, second *t* + 2, second *t* +3, second *t* + 4, second *t* + 5 (Kessler & Greenberg, 1981).

Results

Data analyses proceeded in several steps. First, we conducted analyses to determine whether any potential covariates, such as parental demographics, child gender, and parent order (i.e., which parent went first), needed to be included in further models. Second, we examined correlations between observed toddler negative affect and behavioral strategies within parent as a preliminary indication of the degree of association between variables. Third, we used longitudinal mixed-effects modeling to determine the degree to which behavioral strategies

[1]Due to the paucity of research investigating temporal associations at a micro-analytic level we also tested all of our models with 6-s, 7-s, 8-s, 9-s, 10-s and 15-s lags. The number of significant results was less than expected by chance. Therefore, we have chosen not to include them in any further discussions.

predict subsequent negative affect. Fourth, we used longitudinal mixed-effects modeling to determine the degree to which toddler negative affect predicted the subsequent use of behavioral strategies in an effort to determine if there was a reciprocal relationship between negative affect and behavioral strategies. Mixed-effects modeling analyses were performed using mother-toddler and father-toddler data separately.

Preliminary Analyses Identifying Demographic, Gender, and Parent Differences

Correlational analyses involving composite negative affect and behavioral strategy scores revealed that maternal and paternal characteristics such as age, education, and family income were not significantly related to toddler behaviors. Descriptive statistics for all variables of interest are presented in Table 2. Mixed-effects ANOVAs testing for differences in toddler behaviors with mothers or fathers as a function of child gender or parent context were non-significant. Cross-parent correlations indicated that toddler negative affect (r = .48, $p < .001$) and self-distraction (r = .23, $p < .05$) were positively associated. No significant cross-parent associations for parent or toy-focused strategies were found. No significant differences in toddler behavior (i.e., negative affect and behavioral strategies) as a function of the toy the toddler interacted with were found. We found a significant difference in toddler behavior as a function of parent order; toddlers engaged in more toy-focused ($F(1,92) = 7.91$, $p < .01$) and self-distraction strategies ($F(1,92) = 9.24$, $p < .01$) with the first parent than with the second parent. Therefore, parent order was included as a covariate in all subsequent longitudinal mixed-effects models.

Within-Parent Zero-Order and Partial Correlations of Toddler Variables

As shown in Table 3, the within-parent zero-order and partial correlations, controlling for parent order, between toddlers' negative affect and behavioral strategy performance show different patterns with mothers and fathers. With mothers, a significant positive association was found between toddler negative affect and the parent-focused strategy, indicating that toddlers who attempt to interact more with mothers tend to have more negative affect. In addition, with mothers, a significant negative association was found between toddler negative affect and the toy-focused strategy, indicating that toddlers who attempt to play with the toy show lower levels of negative affect. With fathers, no significant associations between toddler negative affect and behavioral strategies were found. Other differences in correlation patterns emerged between mother-toddler and father-toddler dyads. With fathers, toddlers who showed more parent-focused strategies also showed more self-distraction and less toy-focused strategies. These associations were not significant, though, for mother-toddler dyads. However, for both dyadic pairs, a significant inverse relation between self-distraction and toy-focused strategies emerged.

These correlations suggest that the behavioral strategies are indeed related to toddler negative affect. With correlational analyses, however, it is not possible to establish the direction of the effects nor is it possible to establish if the behavioral strategies and negative affect are contingently related. Indeed, correlations are computed using a mean score of each variable, which eliminates any temporal associations and possible changes in the relationships across time. In addition, the lack of significant correlations between average levels of behavioral strategies and average negative affect during the father-toddler PITS does not necessarily indicate the lack of potential associations at a more microscopic level. Thus, a series of longitudinal mixed-effects analyses were conducted to test the regulating effects of behavioral strategies on toddler negative affect, on a second-by-second basis. In addition, the reciprocal effects of toddler negative affect predicting behavioral strategy performance were also investigated.

Model Specification for Longitudinal Mixed-Effects Model

The model investigating changes in toddler negative affect as a result of behavioral strategy performance can be written as follows:

$$A_{t+1}=b_0+b_1T+b_2A_t+b_3S_t+b_4O+e_{t+1} \quad (1)$$

where T indicates which second of the procedure is being examined (range= 0–90); A_{t+1} is the toddler negative affect one second after time t; A_t is the toddler's negative affect at second t; S_t is the amount of behavioral strategy performed at second t; O is the inclusion of the covariate of parent order; and e_{t+1} is a residual component of change in the toddler's negative affect. The coefficient b_0 is the regression intercept, the coefficient b_1 is the slope indicating the linear rate of change in the outcome variable, and the coefficients b_2, b_3, and b_4 are the effects of the independent variables. This equation was repeated for each behavioral strategy, as well as for each of the 5 different lags (t + 1, t + 2, t + 3, t + 4, and t + 5).

The model investigating changes in behavioral strategy performance as a result of toddler negative affect is similar to Equation 1 and can be written as follows:

$$S_{t+1}=b_0+b_1T+b_2S_t+b_3A_t+b_4O+e_{t+1} \quad (2)$$

The main difference between Equation 1 and Equation 2 is the inclusion of negative affect at second t as an independent variable and behavioral strategy at second t as an independent variable. In addition, S_{t+1} is the toddler behavioral strategy performance at second t + 1, which is the dependent variable in this equation. All other interpretations remain the same. This equation was repeated for each behavioral strategy, as well as for each of the 5 different lags.

In the present study, the negative affect and behavioral strategy variables were grand-mean centered when they served as predictors so that the coefficients reflect average effects for each individual; however, the time variable was not centered because doing so would indicate effects at the intercept when time was at 45-s, which did not have any substantive meaning (Biesanz, Deeb-Sossa, Papadakis, Bollen, & Curran, 2004). In addition, our models specified each coefficient as random, thus allowing each child to have a unique estimate for b_0, b_1, b_2, and b_3 in equations 1 and 2. However, each random effect that is specified increases the number of parameters that are estimated and may affect the power to determine the true relationship (Raudenbush & Bryk, 2002). Conversely, specifying all effects as fixed may also introduce bias. Therefore, effects were only specified as fixed if there were issues related to model convergence. To obtain estimates of these effects, we used a restricted maximum likelihood (REML) approach, as implemented in PROC MIXED.

Validation of Parent-Ignore-Toddler-Situation (PITS)

Prior to testing each of the models, we conducted a longitudinal analysis to determine the effectiveness of the PITS paradigm. The paradigm was designed to elicit frustration; therefore, before testing whether behavioral strategies serve a regulatory function, it is important to establish that toddlers were experiencing negative affect. A similar model to Equation 1 was specified wherein time (range = 0–90-s) served as the independent variable, and toddler negative affect was the dependent variable. Models were tested separately for each parent. With mothers, we found a significant result with negative affect ($t(105) = 2.07$, $p < .05$). Specifically, the estimate of .001 indicated that toddlers were becoming more negative, although not to a great extent, as time during the Ignore episode progressed.

Similar results were found for negative affect with fathers ($t(97) = 2.41$, $p < .05$) with an estimate of .001. These estimates indicate that the PITS was mildly frustrating, in that it only related to low levels of negative affect in toddlers.

The Effects of Behavioral Strategy Performance on Subsequent Negative Affect

Table 4 displays the estimates for Equation 1 (Strategy → Negative Affect) for the mother-toddler and father-toddler Ignore episode. For each strategy, the intercept indicates the estimated average negative affect score at the beginning of the Ignore episode for each of the five time lags. Overall, with both parents, toddlers were beginning the Ignore episode in a mainly neutral state, on average, showing low levels of negative affect. The average time effect (*T*) was non-significant when all other variables were included in the equation for all lagged effects, with both parents. The estimate for each of the covariates captures the relationship between the covariate and initial status of subsequent negative affect. Because the dependent variable is a lagged variable, the estimate indicates the relationship between the covariate and affect at that lagged time. Not surprisingly, we found that negative affect *t* (A_t) significantly predicted subsequent negative affect the majority of the time. The covariate of parent order did not significantly predict toddler negative affect in any of the models, with mothers and fathers, suggesting that the associations between variables were similar regardless of which parent went first when all other variables were included in the equation; therefore estimates for parent order were not included in the tables to conserve space.

For the mother-toddler models (see Table 4) we found that parent-focused strategies significantly predicted negative affect $t + 1$, $t + 2$, $t + 3$. Specifically, the significant estimates of .05, .07, and .05 indicate that for every additional parent-focused strategy toddlers use, their affect became more negative for the next 3-s. The relation between self-distraction and subsequent negative affect also indicated that for every additional self-distraction strategy toddlers use, their affect became slightly more negative (estimate = .01) for the next second immediately following the performance. There were several significant relationships between the toy-focused strategy and subsequent negative affect with mothers. Specifically, the estimates of −.02, −.03, and −.03 indicate that for every additional toy-focused strategy toddlers use, their affect became less negative for the next 3-s immediately following the performance. Overall, results of the mother-toddler models suggest that parent-focused and self-distraction strategies were followed by increases in negative affect whereas toy-focused strategies were followed by decreases in negative affect.

Compared to mother-toddler models, those involving father-toddler data yielded different results (see Table 4). For example, with fathers, the parent-focused and toy-focused strategies only had a significant effect on subsequent negative affect for 1-s as compared to 3-s with mothers; however, the direction of the effects was similar. We also found that the self-distraction strategy did not significantly predict negative affect. Overall, the results of the father-toddler models suggest that parent-focused strategies were followed by increases in negative affect, whereas toy-focused strategies were followed by decreases in negative affect.

The Effects of Toddler Negative Affect on Subsequent Behavioral Strategy Performance

Table 5 displays the estimates for Equation 2 (Negative Affect → Strategy) for the mother-toddler and father-toddler Ignore episode. For each strategy, the intercept indicates the estimated average strategy score at the beginning of the Ignore episode for each of the five time lags. With both parents, toddlers were beginning the episode performing a small, but significant, amount of each strategy. The average time effect (*T*) shows that toddlers were displaying similar amounts of parent-focused, self-distraction, and toy-focused strategies, as

indicated by the significant estimate of .00, as time progressed, with mothers and fathers. In addition, we found that strategy use at time *t* (S_t) significantly predicted the majority of subsequent behavioral strategy performance. The covariate of parent order was significant for several of the father-toddler models and will be discussed below.

For the mother-toddler models (see Table 5) we found that negative affect predicted subsequent behavioral strategy use. Negative affect predicted self-distraction strategy use 1, 2, and 5-s later. The estimates of .07, .07, and .10 indicate that for every additional increase in one unit of negative affect, toddlers performed more self-distraction strategies. Negative affect also predicted toy-focused strategy use four consecutive seconds later. Specifically, the estimates of −.05, −.07, −.05, and −.04 indicate that for every additional increase in one unit of negative affect, toddlers performed less toy-focused strategies. Overall, results from the mother-toddler models suggested that negative affect was associated with subsequent increases in use of self-distraction strategies and decreases in use of toy-focused strategies.

For the father-toddler Ignore episode several significant effects for negative affect on subsequent behavior strategy use were also found (see Table 5). Negative affect predicted parent-focused strategy performance for the following 2-s. Specifically, the estimates of .10 and .07 indicate that for every additional increase of one unit in level of negative affect, toddlers performed more parent-focused strategies. Negative affect also predicted self-distraction strategy performance for all five lags. Specifically, the estimates of .07, .08, .07, . 07, and .10 indicate that for every additional increase in level of negative affect, toddlers performed more self-distraction strategies 1-, 2-, 3-, 4-, and 5-s later. We also found that negative affect predicted the use of toy-focused strategies at all following times. Specifically, the estimates of −.08, −.09, −.12, −.08, and −.08 indicate that for every additional increase in level of negative affect, toddlers were less actively engaged with the toy. The toy-focused strategy models also contained a significant parent order effect for $t + 1$ and $t + 2$. Specifically, the estimates of .04 ($SE = .02$, $p < .05$) and .07 ($SE = .03$, $p < .05$) indicate that the relationship between negative affect and subsequent toy-focused strategy use was more negative when fathers participated first in the Ignore episode. Overall, results from the father-toddler models suggest that negative affect was associated with subsequent increases in parent-focused and self-distraction strategies and decreases in toy-focused strategies.

Discussion

This study was designed to examine toddler's use of behavioral strategies during a mildly frustrating situation with mothers and with fathers. Specifically, the temporal association between behavioral strategies and toddler negative affect was examined on a second-by-second basis to determine whether putative strategies were indeed serving a regulatory effect, defined as decreased negative affect, as well as the immediacy of those effects. Further, we also examined the reciprocal relationship between behavioral strategies and negative affect by testing whether toddler negative affect influences subsequent performance of behavioral strategies. Overall, results of the present study provide evidence that there are cross-parent similarities in these temporal associations, although there was also evidence of context (i.e., parent) specific associations. With mothers, our hypotheses regarding the effects of parent-focused strategies predicting toddler negative affect were supported, and similar results were also found with fathers. In addition, when exploring the effects of toddler negative affect predicting behavioral strategies, we generally found cross-parent similarities in temporal associations.

Toddler Negative Affect

As expected, we found that the Parent Ignore Toddler Situation (PITS) was associated with low levels of negative affect. Specifically, toddlers began the Ignore episode in a neutral state and became more distressed as the episode progressed. This pattern was found when toddlers were with mothers and with fathers. In addition, toddlers displayed similar intensity of negative affect across parent contexts. Thus, when parental attention is directed away from the child during a challenging task, toddlers exhibited low levels of distress. These results are consistent with previous research findings (Bridges & Connell, 1991; Bridges et al., 1997).

Temporal Associations between Putative Behavioral Strategies and Toddler Negative Affect

When examining behaviors at a micro-analytic level, we predicted that mother-focused strategies would be followed by increased levels of negative affect because she was unresponsive to the toddler's bids for attention and help. Consistent with these expectations, we found that toddlers' affect became more negative immediately following the performance of mother-focused strategies, as well as following father-focused strategies. These results exhibit some inconsistencies with previous research, which may be, in part, due to differing methodologies. For example, Diener and Mangelsdorf (1999) found that the parent-focused strategies of fussing to the mother and social referencing (i.e., looking at the mother's face) were associated with decreases in negative affect. Unlike the present study, however, mothers were permitted to respond when the child made a bid. Similarly, Buss and Goldsmith (1998) presented infants and toddlers with an attractive toy, which was then placed behind a barrier for 30-s. In their study, looking to the mother was also associated with decreases in negative affect. Possibly, the longer duration of maternal non-responsiveness in our study (90-s) compared to the Buss and Goldsmith study (30-s), is what led to increased negative affect. Toddlers' negative affect significantly increased throughout the duration of the procedure. Therefore, it is possible that during the first 30-s, parent-focused strategies were more effective at reducing negative affect. Future studies should investigate the timing of the associations between toddler behaviors and negative affect to further delineate when these associations are significant. Overall, in the present study, there is consistent support suggesting that parent-focused strategies were not effective in reducing distress when unavailable parents were the source of the frustration and toddlers were attempting to operate a difficult toy by themselves.

We also found, with both mothers and fathers, that toy-focused strategies were followed by decreased levels of negative affect. Although the toys were difficult for toddlers to operate on their own, it is possible that the toys provided an effective distraction from the unresponsive parent, at least for some toddlers. These results are consistent with previous studies of toddler emotion regulation. Buss and Goldsmith (1998) reported that toddler anger decreased more than expected after toddlers attempted to reach for an attractive toy that was a behind a barrier. Similar effects were found following toddler interaction with the stimulus (e.g., attempting to control the stimulus, explore the stimulus, etc.). Diener and Mangelsdorf (1999) also found that toddler anger decreased after toddlers engaged in problem solving behavior (e.g., attempting to change the nature of the stimulus). Therefore, our results suggest that strategies that involve more sophisticated problem-focused behavior, such as attempting to manipulate the toy, appear to help toddlers' levels of frustration (Kopp, 1989). Research with older children, for example, supports this notion such that problem-focused coping strategies during times of duress are generally found to be more effective than emotion-coping strategies (Compas, Banez, Malcarne, & Worsham, 1991). It is also possible that active engagement with the toy provides them with a more active and effective way to distract themselves than would gazing around the room. For example, Grolnick, Bridges,

and Connell (1996) found that active engagement with objects was associated with lower levels of distress as compared to passive use of objects or simply exploring the room. It would be interesting in future research, however, to examine individual differences in more problem-focused strategies. Some toddlers may not rely on toys as a means to regulate their distress.

We also predicted that self-distraction strategies would be associated with decreases in negative affect; however, this hypothesis was not supported. More specifically, we found that with mothers, self-distraction strategies were followed by increases in negative affect in the immediate second following this behavior (though not beyond that time frame), and, with fathers, no significant associations were found. Given the limited number of findings, however, we should interpret our results with caution. Although previous studies have found that self-distraction strategies can serve as effective regulatory mechanisms, these findings may be limited to samples involving younger infants (e.g., Stifter & Braungart, 1995). Results from toddler studies are somewhat inconsistent. Buss and Goldsmith (1998), for example, found that focusing on another object in the room (i.e., an object not related to the stimulus) was followed by a decrease in negative affect (i.e., anger). Diener and Mangelsdorf (1999) found that the behaviors of avoidance (i.e., turning or moving away from object), distraction (i.e., focusing attention on another object) and self-soothing were associated with maintenance of negative affect (i.e., frustration). It is possible that self-distraction strategies used at older ages may reflect less mature and less effective ways of dealing with frustration, in which there is a problem-solving component (i.e., operating a difficult toy). When the context enables toddlers to engage in more active problem-solving behaviors, it is possible that simply using self-distraction strategies does not serve to provide enough of an intervention to help lower their negative affect. Further studies are needed in order to more carefully examine when and how self-distraction strategies are effective or become ineffective.

Another purpose of the present study was to assess the reciprocal relation between behavioral strategies and toddler negative affect. We were interested in exploring whether toddler negative affect predicted the subsequent use of behavioral strategies to the same extent that behavioral strategies were related to negative affect. Indeed, functionalist theories of emotion regulation suggest that emotions can have a regulatory influence on other processes, including attention and other physiological systems (Campos, Frankel & Camras, 2004; Cole et al., 2004). For example, negative affect (i.e., anger) may activate attention systems and lead to an increased focus on one target. Our results suggest that reciprocity was not the case in all instances, and showed some similarities and some differences across parent context. In both mother- and father-toddler contexts, toy-focused strategies were followed by lower levels of negative affect, which in turn, predicted less use of toy-focused strategies. It is possible that the toys are serving to distract the toddler from the unresponsive parent and decrease negative affect, and because their negative affect has been reduced they no longer need to focus their attention on the toy. Differences across parent contexts, however, also emerged. Self-distraction strategies in mother-toddler contexts and parent-focused strategies in father-toddler contexts also showed reciprocal relationships, however, both strategy types led to increased negative affect. These results suggest that, in addition to emotion being regulated by behavioral strategies, it is also possible for emotion to regulate toddlers' behaviors. Future research, however, needs to continue to explore the influence of the social context on these relationships.

Given that this is the first study to explore this relation at a microanalytic level in toddlers, it is important for future studies to replicate these results and gain a better understanding of their implications. For example, to what extent do individual differences in strategy use relate to toddler's emotion functioning? In addition, it is apparent that the extent of

reciprocal relationships depends on the emotion-eliciting social context. Future work should explore the implications of social contextual differences in strategy use and negative affect.

We were also interested in exploring how quickly the temporal relationships between strategies and negative affect were formed. The results that emerged were complex; however, the results do help to clarify some of the aforementioned relationships. With mothers, the effects of all behavioral strategies on subsequent negative affect appeared quickly and, for parent-focused and toy-focused, lasted for at least three seconds. With fathers, however, the effects of parent-focused and toy-focused strategies on negative affect appeared immediately, but did not last beyond one second. Thus, it is possible that the social context might be influencing temporal differences. Perhaps, toddlers, on average, have had less experience with fathers than with mothers in a teaching-like paradigm; therefore, the effects of behavioral strategies do not last as long as they do with mothers. Moreover, differences in duration and reciprocal patterns between affect and behavioral strategies may reflect a less organized response system when toddlers are in the presence of fathers. In contrast, emotional and regulatory responses may be more organized and coherent when in more familiar circumstances such as those involving the mother. Indeed, Parke (1994) suggested that fathers are more of a playmate, and therefore it is possible that their behavior is less predictable.

Interestingly, when testing the immediacy of the effects of negative affect on subsequent strategy performance, the speed and duration of the temporal effects were different across strategy type and parent context in some instances but not others. With mothers, the effects of negative affect on self-distraction strategies were relatively brief, lasting for two seconds, whereas for fathers, the effects of negative affect on self-distraction strategies were longer-lasting (5-s). Similar cross-parent effects, however, were found for negative affect and toy-focused strategies. The effects of negative affect on the subsequent performance of toy-focused strategies appeared immediately and were relatively longer -lasting with both mothers and fathers (4- and 5-s, respectively). In general, the patterns were somewhat consistent across parents. This suggests that the speed at which negative affect impacts behavior may not be strongly affected by the social context (i.e., mother vs. father). We know very little, however, about what these differences in the timing of temporal effects mean. For example, what does it mean when an effect is present for two seconds as opposed to five seconds? Perhaps an effect lasting five seconds implies more conscious processing on the part of the toddler. Therefore, it is possible that actively engaging with the toy may be more of a conscious strategy than engaging in self-distraction strategies.

Limitations and Future Research Directions

The current study is one of the first to investigate the temporal associations between negative affect and behavioral strategies; however, there are several limitations that should be addressed. For example, the PITS paradigm was found to elicit increasing levels of negative affect, with mothers and fathers, however, the intensities of negative affect were relatively modest. This suggests that the PITS was associated with low levels of distress for 20-month-old toddlers, perhaps reflecting situations that they may encounter on a daily basis. Results from this study, then, may not generalize to situations that evoke heightened levels of distress. Indeed, it is possible that children of this age are accustomed to their parents not being emotionally available at all times. It is also possible that the length of the situation (90-s) may not have been sufficient to elicit greater levels of distress. Future studies may benefit from employing a situation that elicits more distress to gain a more comprehensive understanding of the temporal relations between behavioral strategies and distress. In addition, the type of toy was not counterbalanced. It is possible that the associations found may also be a function of the type of toy that the child was engaged with.

Therefore, future studies should take care to counterbalance both parent order and the type of toy.

Second, our analyses do not allow us to determine when these associations are occurring during the 90-s episode. For example, it is possible that toddlers are less likely to persist with the toy after repeated unsuccessful attempts and, therefore, this strategy becomes less effective at reducing negative affect over time. It is also possible that toddlers develop specific patterns of responding during distressing situations and during this episode they may be cycling through different strategies. Third, we coded toddler negative affect and putative behavioral strategies on a second-by-second basis. Perhaps one second is too long, and a micro analysis, at the frame-by-frame level, would allow for a more precise investigation of the temporal associations across time. Therefore, future studies should closely investigate the changes across time by examining the patterns of behavioral strategy use and how those patterns relate to toddler negative affect. Finally, future research should consider the role of child temperament, parent-child attachment, or parental sensitivity in promoting the use of behavioral strategies that regulate negative affect. These characteristics may provide an explanation for the cross-parent context results in the present study and for individual differences in response patterns.

Finally, the generalizability of the results of the present study may be limited to situations in which the unresponsive parent is the potential source of distress and toys are present to occupy the toddler's attention. In addition, the degree of toy difficulty may contribute to toddlers' distress in the present study. For example, if the toys were too difficult for the toddler to operate they may not remain as an effective distraction. Furthermore, the toys may serve as the *primary* source of distress. Future studies should experimentally manipulate the difficulty level of the toys and the involvement of the parents to explore the effects of these conditions on toddler emotion regulation. In addition, future studies should examine individual differences in the effectiveness of manipulating challenging toys in regulating distress.

Overall, the present study supports previous research suggesting that certain behavioral strategies, such as actively engaging with a toy, are effective at reducing levels of negative affect, whereas other strategies, such as looking at an emotionally unavailable parent, are associated with increased levels of negative affect during a task that elicited low levels of frustration. The present study expands our current knowledge by establishing that there are indeed temporal associations between putative regulatory behaviors and negative affect, in which certain behavioral strategies are followed by decreases in negative affect, and it is these strategies that we may label as "regulatory". Moreover, this is one of the first studies to investigate the reciprocal relations between behavioral strategies and negative affect in different social contexts, and found that emotion is also serving to regulate behaviors. Finally, using techniques to create lags in our data, we have also been able to test the relative speed at which these relationships are being formed. Therefore, the current study not only provides evidence for the effectiveness of certain regulatory behaviors, but also challenges others to move beyond our traditional ways of assessing and conceptualizing emotion regulation.

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Table 1

Brief Definitions of Toddler Behavioral Strategies

Behavioral Strategies	Definition	Kappa		
Parent-Focused		Mother-Toddler	Father-Toddler	Overall
Looking at parent	Turns head toward parent; Eyes shift toward parent	.89	.83	.86
Vocalizing to parent	Communication directed to parent, including asking for assistance with toy	.90	.93	.92
Gesturing to parent	Making bids for attention from parent (e.g., pointing)	1.0	1.0	1.0
Self-Distraction				
Distraction	Attention focused on another object in the room	.89	.84	.86
Vocalizing to self	Engaging in communication that was not directed to the parent	.90	.87	.88
Self-soothing	Behaviors that serve to calm (e.g., thumb sucking, twirling hair, etc.)	.97	1.0	.98
Toy-Focused				
Holding the toy	Holding on to the toy and not playing with it	.69	.50	.59
Passive engagement	Playing with toy without trying to operate it (e.g., tapping microphone)	.79	.67	.73
Active engagement	Trying to operate toy such as turning on power, and inserting cassette tape into player	.90	.83	.87
Looking at toy	Visual attention focused exclusively on the toy	.95	.93	.94
Strategies Removed				
High intensity motor	Banging table, kicking table, or banging toy	.96	1.0	.98
Vocalizing to other parent	Attempts to communicate with the parent not in the room, such as calling for mother when the father was in the room	1.0	.96	.98
Escape	Physical effort to get out of chair	.97	1.0	.98

Table 2

Descriptive Statistics for Behavioral Strategies and Toddler Negative Affect During Mother-Toddler and Father-Toddler Ignore Situation

Variable	*N*	*Min.*	*Max.*	*M*	*SD*
Negative Affect					
Mother	106	.00	1.87	.11	.27
Father	98	.00	2.42	.13	.33
Mother First					
Mother	59	.00	1.87	.14	.34
Father	49	.00	1.46	.14	.30
Father First					
Mother	47	.00	.54	.07	.13
Father	49	.00	2.42	.12	.37
Parent-Focused					
Overall Mother	106	.00	1.00	.14	.15
Overall Father	98	.00	.76	.17	.17
Mother First					
Mother	59	.00	1.00	.16	.18
Father	49	.00	.76	.17	.17
Father First					
Mother	47	.00	.51	.13	.11
Father	49	.00	.63	.18	.17
Self-Distraction					
Overall Mother	106	.00	1.59	.36	.29
Overall Father	98	.00	1.48	.31	.28
Mother First					
Mother	59	.00	1.38	.40	.26
Father	49	.00	1.40	.28	.27
Father First					
Mother	47	.00	1.59	.31	.31
Father	49	.00	1.48	.34	.28
Toy-Focused					
Overall Mother	106	.76	1.94	1.33	.26

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Variable	***N***	***Min.***	***Max.***	***M***	***SD***
Overall Father	98	.70	2.00	1.33	.27
Mother First					
Mother	59	.79	1.94	1.36	.26
Father	49	.72	1.95	1.28	.26
Father First					
Mother	47	.76	1.76	1.29	.25
Father	49	.70	2.00	1.39	.27

Table 3

Within-Parent Correlations for Toddler Negative Affect and Regulatory Strategies

Variable	1	2	3	4
Mother-Toddler				
1. Negative Affect	--	.24*	.15	−.27*
2. Parent-Focused	.40***	--	−.03	−.23*
3. Self-Distraction	.16	−.02	--	−.51***
4. Toy-Focused	−.19*	−.17	−.45***	--
Father-Toddler				
1. Negative Affect	--	.13	.11	−.08
2. Parent-Focused	.13	--	.25*	−.23*
3. Self-Distraction	.17	.26*	--	−.57***
4. Toy-Focused	−.16	−.23*	−.55***	--

Note: Partial correlations controlling for parent order presented above the diagonal.

Zero-order correlations presented below the diagonal.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 4

Effects of Behavioral Strategy Performance on Subsequent Negative Affect During Mother-Toddler and Father-Toddler Ignore Situation

	Time *t* + 1	Time *t* + 2	Time *t* + 3	Time *t* + 4	Time *t* + 5
Variable	**Est. (*SE*)**	**Est. (*SE*)**	**Est. (*SE*)**	**Est. (*SE*)**	**Est. (*SE*)**
Mother-Toddler					
Parent-Focused					
Intercept	.08 (.01)***	.08 (.02)***	.09 (.03)**	.09 (.03)**	.09 (.03)**
Time (T)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Affect *t* (A_t)	.54 (.03)***	.24 (.04)***	.14 (.03)***	.08 (.03)**	.03 (.03)
Strategy *t* (S_t)	**.05 (.01)*****	**.07 (.02)*****	**.05 (.02)****	**.03 (.01)**	**.02 (.01)**
Self-Distraction					
Intercept	.09 (.01)***	.08 (.02)***	.09 (.03)**	.10 (.04)**	.10 (.04)**
Time (T)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Affect *t* (A_t)	.60 (.03)***	.29 (.04)***	.17 (.03)***	.10 (.03)**	.04 (.03)
Strategy *t* (S_t)	**.01 (.01)***	**.02 (.01)**	**.02 (.03)**	**.01 (.02)**	**.01 (.01)**
Toy-Focused					
Intercept	.12 (.01)^{***1}	.09 (.02)***	.10 (.03)***	.10 (.03)**	.09 (.03)**
Time (T)	.00 (.00)^{1}	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Affect *t* (A_t)	.77 (.01)^{***1}	.30 (.04)***	.19 (.03)***	.10 (.03)**	.04 (.03)
Strategy *t* (S_t)	**−.02 (.01)^{***1}**	**−.03 (.01)*****	**−.03 (.01)****	**−.02 (.01)**	**−.02 (.01)**
Father-Toddler					
Parent-Focused					
Intercept	.10 (.01)***	.09 (.02)***	.09 (.03)**	.10 (.03)**	.10 (.04)*
Time (T)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Affect *t* (A_t)	.50 (.04)***	.27 (.04)***	.14 (.04)**	.09 (.04)	.06 (.04)
Strategy *t* (S_t)	**.02 (.01)****	**.02 (.01)**	**.01 (.01)**	**.01 (.01)**	**.02 (.01)**
Self-Distraction					
Intercept	.10 (.01)***	.09 (.02)***	.09 (.03)**	.10 (.03)**	.10 (.04)*
Time (T)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)

	Time *t* + 1	Time *t* + 2	Time *t* + 3	Time *t* + 4	Time *t* + 5
Variable	**Est. (*SE*)**	**Est. (*SE*)**	**Est. (*SE*)**	**Est. (*SE*)**	**Est. (*SE*)**
Affect *t* (A_t)	.50 (.04)***	.27 (.04)***	.14 (.04)**	.10 (.04)*	.09 (.03)*
Strategy *t* (S_t)	**.01 (.01)**	**.01 (.01)**	**.01 (.01)**	**.00 (.01)**	**.00 (.01)**
Toy-Focused					
Intercept	.10 (.01)***	.09 (.02)***	.09 (.03)**	.09 (.03)**	.09 (.04)*
Time (T)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Affect *t* (A_t)	.49 (.03)***	.27 (.04)***	.15 (.04)**	.09 (.04)*	.09 (.03)*
Strategy *t* (S_t)	**−.02 (.01)****	**−.01 (.01)**	**−.01 (.01)**	**−.01 (.01)**	**−.01 (.01)**

Note:

* $p < .05$.

** $p < .01$.

*** $p < .001$.

The variable of interest in the mixed-effects models is bolded.

[1] Initial model with all random effects specified would not converge. Affect variable specified as a fixed effect.

Table 5

Effects of Toddler Negative Affect on Subsequent Behavioral Strategy Performance During Mother-Toddler and Father-Toddler Ignore Situation

	Time *t* + 1	Time *t* + 2	Time *t* + 3	Time *t* + 4	Time *t* + 5
Variable	**Est. (*SE*)**	**Est. (*SE*)**	**Est. (*SE*)**	**Est. (*SE*)**	**Est. (*SE*)**
Mother-Toddler					
Parent-Focused					
Intercept	.16 (.01)***	.17 (.02)***	.19 (.03)***	.19 (.03)***	.18 (.03)***
Time (T)	.00 (.00)	.00 (.00)	.00 (.00)*	.00 (.00)*	.00 (.00)
Affect *t* (A_t)	**.06 (.03)**	**.04 (.04)**	**.00 (.03)**	**.02 (.04)**	**.01 (.02)**
Strategy *t* (S_t)	.45 (.03)***	.14 (.02)***	.03 (.02)	−.01 (.02)	−.03 (.02)
Self-Distraction					
Intercept	.28 (.02)***	.25 (.03)***	.25 (.03)***	.25 (.03)***	.24 (.04)***
Time (T)	.00 (.00)	.00 (.00)*	.00 (.00)*	.00 (.00)*	.00 (.00)*
Affect *t* (A_t)	**.07 (.02)****	**.07 (.03)***	**.05 (.03)**	**.07 (.04)**	**.10 (.02)*****
Strategy *t* (S_t)	.53 (.02)***	.32 (.03)***	.20 (.04)***	.15 (.03)***	.11 (.02)***
Toy-Focused					
Intercept	1.38 (.02)***1	1.40 (.03)***1	1.41 (.03)***1	1.41 (.04)***1	1.42 (.04)***
Time (T)	.00 (.00)***1	.00 (.00)***1	.00 (.00)***1	.00 (.00)***1	.00 (.00)**
Affect *t* (A_t)	**−.05 (.01)***1**	**−.07 (.02)***1**	**−.05 (.02)**1**	**−.04 (.02)*1**	**−.03 (.02)**
Strategy *t* (S_t)	.61 (.01)***1	.37 (.02)***1	.25 (.02)***1	.14 (.02)***1	.08 (.02)***
Father-Toddler					
Parent-Focused					
Intercept	.17 (.02)***	.18 (.03)***1	.18 (.03)***	.17 (.04)***	.18 (.04)***
Time (T)	.00 (.00)	.00 (.00)1	.00 (.00)	.00 (.00)	.00 (.00)
Affect *t* (A_t)	**.10 (.04)***	**.07 (.02)***1**	**.09 (.05)**	**.05 (.06)**	**.04 (.06)**
Strategy *t* (S_t)	.48 (.02)***	.19 (.03)***1	.10 (.03)***	.05 (.02)*	.02 (.02)
Self-Distraction					
Intercept	.28 (.01)***	.26 (.02)***	.25 (.03)***	.25 (.03)***	.25 (.03)***

	Time *t* + 1	Time *t* + 2	Time *t* + 3	Time *t* + 4	Time *t* + 5
Variable	**Est. (*SE*)**	**Est. (*SE*)**	**Est. (*SE*)**	**Est. (*SE*)**	**Est. (*SE*)**
Time (T)	.00 (.00)	.00 (.00)	.00 (.00)*	.00 (.00)*	.00 (.00)
Affect *t* (A_t)	**.07 (.02)*** **	**.08 (.03)***	**.07 (.03)***	**.07 (.03)***	**.10 (.04)***
Strategy *t* (S_t)	.53 (.02)***	.32 (.02)***	.20 (.02)***	.15 (.02)***	.10 (.02)***
Toy-Focused					
Intercept	1.37 (.02)****1*	1.38 (.03)***	1.40 (.04)***	1.39 (.04)***	1.38 (.04)***
Time (T)	.00 (.00)****1*	.00 (.00)***	.00 (.00)***	.00 (.00)***	.00 (.00)**
Affect *t* (A_t)	**−.08 (.01)*****1*	**−.09 (.02)*****	**−.12 (.03)*****	**−.08 (.03)***	**−.08 (.04)***
Strategy *t* (S_t)	.61 (.02)****1*	.36 (.02)***	.22 (.02)***	.15 (.02)***	.09 (.02)***

Note:

* $p < .05$.

** $p < .01$.

*** $p < .001$.

The variable of interest in the mixed-effects models is bolded.

1 Initial model with all random effects specified would not converge. Affect variable specified as fixed effect.