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Maternal Expectations for Toddlers' Reactions to Novelty: Relations of Maternal Internalizing Symptoms and Parenting Dimensions to Expectations and Accuracy of Expectations

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SYNOPSIS

Objective—Although maternal internalizing symptoms and parenting dimensions have been linked to reports and perceptions of children's behavior, it remains relatively unknown whether these characteristics relate to expectations or the accuracy of expectations for toddlers' responses to novel situations.

Design—A community sample of 117 mother-toddler dyads participated in a laboratory visit and questionnaire completion. At the laboratory, mothers were interviewed about their expectations for their toddlers' behaviors in a variety of novel tasks; toddlers then participated in these activities, and trained coders scored their behaviors. Mothers completed questionnaires assessing demographics, depressive and worry symptoms, and parenting dimensions.

Results—Mothers who reported more worry expected their toddlers to display more fearful behavior during the laboratory tasks, but worry did not moderate how accurately maternal expectations predicted toddlers' observed behavior. When also reporting a low level of authoritative-responsive parenting, maternal depressive symptoms moderated the association between maternal expectations and observed toddler behavior, such that, as depressive symptoms increased, maternal expectations related less strongly to toddler behavior.

Conclusions—When mothers were asked about their expectations for their toddlers' behavior in the same novel situations from which experimenters observe this behavior, symptoms and parenting had minimal effect on the accuracy of mothers' expectations. When in the context of low authoritative-responsive parenting, however, depressive symptoms related to less accurate predictions of their toddlers' fearful behavior.

INTRODUCTION

Mothers who exhibit depressive and anxious symptoms report their children's temperaments as more negative, and these reports have poorer concordance with laboratory observation of temperament, as compared to mothers without symptoms (Leerkes & Crockenberg, 2003; West

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As mothers endorsed lower levels of authoritative-responsive parenting, increased maternal depression related to lower accuracy in predicting their toddlers' distress to laboratory tasks; maternal symptoms and parenting did not otherwise relate to changes in accuracy.

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& Newman, 2003). Little is known, however, about how depressive and anxious symptoms relate to maternal expectations for children's future behavior. In addition, parenting dimensions have infrequently been investigated as relating to maternal expectations for children's behavior. This may be particularly important to consider for children's displays of fearful behavior because maternal perceptions of fear have important implications for parenting behavior and children's subsequent anxiety development (Dadds & Roth, 2001). The current study aimed to clarify these relations by examining (1) how mothers' depressive and worry symptoms and dimensions of authoritative-responsive and authoritarian parenting relate to maternal expectations for their toddlers' reactions to novel laboratory tasks and (2) whether these maternal characteristics relate to variation in the accuracy of these expectations.

Mothers' attunement to their children's potential distress undoubtedly influences their immediate reactions and long-term socialization of children's emotions and behavior. Accurately predicting their children's distress may prepare mothers to act more decisively and contingently than they would when children's behaviors are unexpected. These actions, in turn, would shape how children experience novelty, which has important implications for anxiety development (e.g., Crockenberg & Leerkes, 2006). In general, mothers' accurate appraisals of children's distress have been linked to children's effective coping and positive adjustment (Davidov & Grusec, 2006; Hastings & Grusec, 1997; Sharp, Fonagy, & Goodyer, 2006), putatively because of mothers' contingent and sensitive responses. Accuracy appears to have different implications for fearful children. Mothers of more temperamentally fearful toddlers display more protective behavior when they accurately predict their toddlers' distress to novelty (Kiel & Buss, in press). It is therefore important to understand what characteristics relate to the valence and accuracy of maternal expectations for toddler distress.

Maternal Internalizing Symptoms

Although few studies have explicitly examined maternal expectations for children's future behavior, the literature suggests that mothers' internalizing symptoms relate to their perceptions and report of child temperament. Mothers who self-report more depressive and anxiety symptoms have described their children's temperaments and behaviors as more negative and with lower concordance to laboratory observation of children's behavior (e.g., Coyne, Low, Miller, Seifer, & Dickstein, 2007; Leerkes & Crockenberg, 2003; Youngstrom, Izard, & Ackerman, 1999; although see Conrad & Hammen, 1989), even at mild to moderate levels of symptoms (West & Newman, 2003). The negative emotions associated with internalizing symptoms may affect attention to and processing of information provided by their children (Dix, 1991; Youngstrom et al., 1999) and cause mothers to become more focused on their own internal experiences (Mor & Winquist, 2002) and less focused on their children's concerns (Dix, Gershoff, Meunier, & Miller, 2004). Within the anxiety spectrum, worry in particular relates to attunement to internal physiological changes (Borkovec, Robinson, Pruzinsky, & DePree, 1983; Thayer, Friedman, & Borkovec, 1996) and to cognitive deficits and distortion (Borkovec et al., 1983; Compton & Mintzer, 2001).

Accordingly, mothers with internalizing symptoms may hold more negative and less accurate expectations for their children's future behavior. Both depressive and worry symptoms have been associated with higher expectations for negative events in general, and depressive symptoms have been associated with lower expectations for positive events in adults' own personal experiences (MacLeod & Byrne, 1996). This would suggest that mothers' internalizing symptoms likely relate to more negative, less positive expectations for their children.

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Maternal Parenting Dimensions

Many studies have demonstrated a relation between internalizing symptoms and less optimal parenting (e.g., Kendler, Sham, & MacLean, 1997; Kochanska, 1991; Kochanska, Kuczynski, & Maguire, 1989; Lovejoy, Graczyk, O'Hare, & Neuman, 2000; Woodruff-Bordon, Morrow, Bourland, & Cambron, 2002). Of more central focus to the current study, however, is that parenting dimensions (i.e., beliefs and attitudes about childrearing as reflected by specific practices) may also relate to the direction and accuracy of maternal expectations for toddler behavior. Authoritative and authoritarian parenting have been examined as dimensions (e.g., Hastings & Rubin, 1999; Kochanska, 1990; Kochanksa, Kuczynski, & Radke-Yarrow, 1989), which have been construed from parenting behaviors identified by Baumrind (1971) and relate to underlying beliefs about childrearing (e.g., goals, attributions, and emotional reactions).

Authoritative parenting is characterized by both high responsiveness to the child and high demands for maturity. We focus on the responsiveness component of authoritative parenting because it reflects variation in mothers' degree of orientation towards their children. We refer to this dimension as *authoritative-responsive parenting*, which consists of warmth and involvement, reasoning/induction, allowing democratic participation by the child, and being good natured and easy going (Robinson, Mandleco, Olsen, & Hart, 1995). Mothers scoring high on authoritative-responsive parenting would endorse focusing on teaching their children and engaging in open communication (Robinson et al., 1995). Mothers endorsing these behaviors place greater importance on empathic goals, attribute their children's problem behavior to external causes, and are unlikely to report negative emotions in response to a variety of child behaviors (Coplan, Hastings, Lagace-Seguin, & Moulton, 2002). In the same vein, more responsive mothers would be more focused on their children's emotions, more attuned to situational nuances in children's behavior, and less likely to have negative emotions that promote self-focus.

The authoritarian dimension consists of verbal hostility, corporal punishment, non-reasoning/punitive strategies, and directiveness (Robinson et al., 1995). Mothers scoring high on authoritarian parenting would endorse enacting discipline in ways that focus on alleviating their own negative emotional reactions to their children's misbehavior (Robinson et al., 1995). Mothers endorsing these behaviors may be less accurate because they place more importance on parent-centered goals (suggesting more self-orientation) and less importance on empathic goals such as helping the child feel good about or learn from the situation (suggesting less attunement to the child), and because they attribute children's behavior to internal causes (suggesting less likelihood of anticipating situational nuances of behavior; Coplan et al., 2002; Hastings & Rubin, 1999). Authoritarian parenting would, therefore, likely interfere with accurately predicting children's behavior in novel situations, and this interference may occur because of the negative emotion these practices enhance. Parent-centered, less empathic goals are less likely to coordinate with children's goals, creating conflict and negative emotion, particularly frustration (Dix, 1991). Similarly to internalizing problems, this heightened negative emotion causes a negative bias in how parents process and interpret child behavior (Dix, 1993; Dix, Ruble, & Zombarabo, 1989). Parents subsequently focus on negative aspects of child behavior (Dix, 1991). Thus, authoritarian parenting may relate to more negative expectations for toddlers' reactions to novelty that are less accurate.

Parenting dimensions may also moderate the extent to which internalizing symptoms relate to the valence and accuracy of expectations. Although both depressive symptoms and worry might shift focus inward towards negative feelings, authoritative-responsive parenting might buffer against these effects by maintaining focus on the child and supporting openness and flexibility in how a mother thinks about her child. If higher levels of authoritarian parenting provide a context for expectations of negative behavior and lower accuracy of expectations,

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increased internalizing symptoms might be especially likely to interfere with the accuracy of mothers' expectations of their children's behavior as mothers endorse more authoritarian parenting. These interactive effects of internalizing symptoms and parenting dimensions have infrequently been examined. In one notable exception, Kochanska (1990) investigated maternal beliefs on a single authoritative-authoritarian dimension in depressed and non-depressed mothers and found that depressed mothers rated their children higher on externalizing problems when mothers endorsed more authoritarian beliefs, but not when mothers endorsed more authoritative beliefs. Questions remain about whether such relations occur for mothers' expectations for their children's fear reactions. The current study aimed to address this gap.

Context of Assessment

Several issues related to the context of assessment are relevant to the study of maternal accuracy. When assessing maternal accuracy, it is important not only to provide mothers and raters with the same context, but also to assess multiple situations. Maternal report and laboratory observation of child behavior often assess different contexts (a variety of previously experienced situations versus the specific situations in the laboratory, respectively) and degrees of generality (long periods of time versus one briefer observation) (Rothbart & Bates, 1998). These methodological differences likely attenuate the concordance between maternal report and observed behavior. Moreover, children may display differences in behavior at home versus in the laboratory that vary systematically with maternal symptoms or parenting practices (Richters, 1992). Having mothers and observers rate children within the same context has improved concordance (Bornstein, Gaughran, & Segui, 1991; Seifer, Sameroff, Barrett, & Krafchuk, 1994). Using multiple assessments also increases the reliability of a particular mother's pattern of expectations (Seifer et al., 1994) and provides a more thorough picture of children's behavior by accounting for the heterogeneity of toddlers' behaviors within and across different situations (Aksan & Kochanska, 2004; Buss, Davidson, Kalin, & Goldsmith, 2004; Goldsmith et al., 1987; Henderson, Marshall, Fox, & Rubin, 2004). Refraining from aggregating across contexts would best acknowledge this variability. The current study addresses these issues of context.

The Current Study

Maternal internalizing symptoms and parenting dimensions contribute to maternal perceptions of young children's behavior. This is important because maternal perceptions shape the quality of mother-child interactions that affect children's adjustment. How internalizing symptoms and parenting dimensions relate to maternal expectations and the accuracy of these expectations remains understudied, particularly in relation to children's reactions to fear-eliciting situations. To this end, the current study focused on maternal expectations for toddlers' reactions to novel tasks. Given the potential for parenting practices to moderate relations between maternal symptoms and expectations, we examined the interaction between maternal internalizing symptoms and parenting dimensions in relating to maternal expectations. We hypothesized that mothers' depressive and worry symptoms would relate to maternal expectations of more fearful toddler behavior. We further hypothesized that the relations between mothers' internalizing symptoms and expectations would be moderated, such that increased maternal authoritative-responsive parenting would decrease the relation between mothers' internalizing symptoms and maternal expectations, and increased maternal authoritarian parenting would strengthen the relations.

Furthermore, we examined how maternal internalizing symptoms and parenting dimensions moderated the accuracy with which maternal expectations predict toddlers' actual behaviors. Given previous evidence that mothers' internalizing symptoms negatively affect concordance, we hypothesized that mothers' internalizing symptoms would similarly hinder accuracy. We

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further hypothesized that the extent to which mothers' internalizing symptoms relate to changes in accuracy would again be moderated by parenting dimensions. Because authoritative-responsive parenting is more child-oriented and authoritarian parenting is more parent-oriented, we hypothesized that the moderating effects of internalizing symptoms on the association between expectations and observed toddler behavior would be buffered by increased authoritative- responsive parenting but exacerbated by increased authoritarian parenting.

METHOD

Participants

One hundred and seventeen toddlers (54 female) and their mothers participated in a laboratory visit and questionnaire completion when toddlers were approximately 24 months old (M = 24.78 months, SD = 0.74) as part of a larger study. We recruited mothers both through the mail according to local published birth records (n = 100) and in person at local meetings of the Women, Infants, and Children (WIC) program (n = 17). Children represented their community in terms of race (81% European American, 7% African-American, 8% Asian-American, 1% American Indian, 2% bi-racial, and 1% "other") and ethnicity (94% not Latin American, 6% Latin American). One hundred and nine mothers (93%) reported that toddlers lived with both biological parents. Mothers ranged in number of years of education from 11 to 20+ and in general had a college education (M = 16.31 years, SD = 2.43). Families' gross annual income ranged from below $16,000 to above $60,000, with the majority (68%) reporting at least $41,000.

Procedure

Upon a show of interest in joining the study (by returning a postcard through the mail or signing up at a WIC meeting), an experimenter called the mother to schedule a laboratory visit and sent her a packet containing a consent form and questionnaires. At the laboratory, the experimenter told the mother that her toddler would be participating in a variety of novel tasks (i.e., interactions with a male stranger, a female clown, a puppet show, an unpredictable robot toy, and a remote-controlled spider toy) and interviewed her about her expectations ("predictions") for her toddler's specific reactions to the tasks. For each task, the experimenter asked the mother to make 6 to 8 predictions with questions like, "Will your child approach the stimulus?" and "Will your child want to stay close to you?" Mothers were instructed to answer the questions, "*Definitely yes*," "*Probably yes*," "*Probably no*," or "*Definitely no*." (A complete list of predictions for each episode can be found in the Appendix.) Toddlers then participated in the tasks in a set order. For purposes of the larger study, mothers were instructed to remain neutral for approximately half of the episodes (Stranger Approach and Robot) and act "however you normally would" for the other half of episodes (Clown, Puppet Show, and Spider). Mothers were aware of these instructions for each episode before making predictions so they could take this into account while forming expectations.[1] Tasks occurred in the same experiment room and were staggered with neutral games and breaks. A camera situated behind a one-way mirror on one wall of the experiment room videotaped the tasks for later scoring.

Novelty tasks were modified from the Laboratory Temperament Assessment Battery (Lab-TAB; Buss & Goldsmith, 2000) and other standard laboratory procedures (e.g., Nachmias, Gunnar, Mangelsdorf, Parritz, & Buss, 1996) designed to assess individual differences in

[1]Whether instructions for particular episodes (i.e., be uninvolved versus be involved) moderated the extent to which maternal expectations related to toddler behavior (i.e., affected accuracy) was examined statistically in a similar multilevel model as primary analyses. No difference was found (t = −0.01, p = .99), so accuracy was assessed across all episodes.

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wariness. The episodes varied in the intensity of fear typically elicited (e.g., puppet show = lower intensity, spider = higher intensity) and in the type of fear (object or social) they assessed.

Afterwards, mothers took home a short set of questionnaires assessing depressive and worry symptoms in a pre-addressed stamped envelope. Mothers reported on their symptoms after the visit to prevent influence on their behavior during the visit.

Measures

Maternal predictions—Because the tasks elicited different intensities and types of fear, and because we expected heterogeneity in toddlers' reactions within and across episodes, we asked mothers questions specific to each of the tasks. Thirty-five maternal predictions across the 5 activities included expectations about the child's proximity to mother, general wariness, approach to the stimulus, involvement with games, and crying/fussing during episodes, among others (see Appendix for complete list). Predictions were reversed as necessary such that higher scores indicated higher expectations of distress (0 = *Definitely no distress*, 1 = *Probably no distress*, 2 = *Probably experience distress*, and 3 = *Definitely experience distress*). For example, for the question "Will your child approach the clown?" predictions were scored as follows: *Definitely yes* = 0, i = 1, Probably no = 2, and *Definitely no* = 3; for the question, "Will your child want to stay close to you?" predictions were scored as follows: *Definitely yes* = 3, *Probably yes* = 2, *Probably no* = 1, and *Definitely no* = 0. We did not aggregate predictions; each prediction corresponded to a specific toddler behavior.

Toddler behaviors—Trained graduate and undergraduate research assistants scored toddler behaviors with systematic approaches developed specifically to match the maternal predictions. For example, the maternal prediction of "Will your child want to stay close to you?" in an episode corresponded to the scoring of "proximity to mother" in that episode. Reliability was computed between coders and a master coder on 15–20% of cases as the intraclass correlation coefficient (*ICC*) for variables on interval scales or Cohen's *kappa* for variables more ordinal in nature. For behaviors scored in smaller epochs throughout the episode, reliability was computed on an epoch-by-epoch basis. *ICC*s ranged from .68 to .98, and *kappa*s ranged from .71 to .99.

General descriptions of behaviors and their scores follow, and the Appendix provides a complete list of behaviors scored in each episode and their corresponding maternal predictions. "Distress vocalizations" and "Attempt to be held" were scored on a 0 (*none*) to 3 (*extreme display*) scale each 10-s interval of the episode. For each behavior, an average of the scores across the episode provided a final score. "Proximity to mother" was scored each second of the episode as 0 = *further than 2 feet from mother*, 1 = *within 2 feet of mother*, 2 = *touching mother*, and an average of scores across the episode yielded the final score. "Boldness" (i.e., approaching, playing comfortably) and "Shyness" (withdrawal, freezing, refusal to interact) were scored on a 1 (*none*) to 5 (*many long or intense displays*) scale to capture the child's behavior throughout the episode. "Distress after Stranger's questions" was scored on a similar 1 to 5 scale following each of the stranger's questions, and the average yielded a final score. In Stranger Approach, "Intensity of greeting" was scored on a 0 (*no greeting*) to 3 (*enthusiastic greeting*) scale to capture the child's response within 10 s of the stranger's entrance, and "Proportion of responses" was scored as the proportion of questions the stranger asked to which the child offered a verbal or non-verbal (e.g., head-nod) response. In Robot and Spider, "Intensity of play" was scored on a 0 (*none*) to 3 (*touches toy comfortably for 2 s or longer*) scale. In Clown and Puppet Show, "Number of games played" was a count of the number of activities in which the child engaged, ranging 0–3, and "Number of vocalizations to the clown/puppets" was a count of the number of vocalizations directed at the respective stimulus. "Willingness to help puppets" was scored on a 0 (*no attempt to recover ball*) to 3 (*hands ball*

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to puppets) scale to capture the maximum intensity of behavior the child showed during the catch game. Because of the variety of scales used, behaviors were standardized and assigned Z-scores.

Maternal symptomotology—Mothers reported on their depressive symptoms using the Center for Epidemiological Studies – Depression scale (CES-D; Radloff, 1977), which is a 20-item measure used to assess depressive symptoms in the general population. Mothers were asked to rate on a 0 (*rarely to none of the time*) to 3 (*most or all of the time*) scale how often they experienced various depressive symptoms (e.g., "I felt depressed."). A mean of the 20 items yielded an overall depressive symptom score (α = .80).

Mothers reported on their worry symptoms with the Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990). The PSWQ is a 16-item measure on which mothers reported the extent of worry concerns related to generalized anxiety disorder (e.g., "I am always worrying about something.") on a 1 (*Not at all typical*) to 5 (*Very typical*) scale. A mean of all items was used as the measure of worry symptoms (α = .93).

Parenting dimensions—Mothers reported on their parenting with the Parenting Practices Questionnaire (PPQ; Robinson, et al., 1995), a 62-item measure assessing authoritative, authoritarian, and permissive parenting practices. Mothers indicated how often they displayed various parenting behaviors on a 1 (*Never*) to 5 (*Always*) scale. The current study focused on the Authoritative and Authoritarian scales. The Authoritative scale comprised 27 items (α = .86) within subscales of Warmth and Involvement (e.g., "I am responsive to my child's feelings and needs."), Reasoning/Induction (e.g., "I explain how I feel about his/her good and bad behavior."), Democratic Participation (e.g., "I take my child's desires into account before asking him/her to do something."), and Good Natured/Easy Going (e.g., "I show respect for my child's opinions by encouraging him/her to express them."). Given that these subscales focused on the responsiveness component of authoritative parenting, we refer to the overall scale as *authoritative-responsive parenting*. The Authoritarian scale (20 items; α = .77) contained subscales of Verbal Hostility (e.g., "I yell or shout when my child misbehaves."), Corporal Punishment (e.g., "I guide my child by punishment more than by reason."), Nonreasoning/Punitive Strategies (e.g., "I punish by putting my child off somewhere alone with little if any explanation."), and Directiveness (e.g., "I demand my child does/do things."). We refer to this scale as authoritarian parenting.

RESULTS

Missing Data

Of the 117 participants, 26 failed to return the packet of symptomotology measures and 13 did not complete the PPQ. Missing Value Analysis in SPSS 16.0 revealed a non-significant Little's MCAR test, χ^2 (49) = 55.64, p = .24, suggesting that missing data may have occurred completely at random. To avoid any parameter bias that may result from excluding participants with missing data, we used the EM algorithm to impute missing data. The algorithm used maternal education, income, gender, recruitment method, mothers' mean predictions, toddlers' mean behaviors, and available values of the PPQ, CES-D, and PSWQ.

Descriptive Statistics and Bivariate Relations

Descriptive statistics and bivariate relations among variables are presented in Table 1. Mothers reported a range of symptoms, from none to levels indicating risk for disorder. In addition to computing means for primary analyses, we computed summed scores of scales to compare to standards in the literature. Scores of the CES-D indicated mild to moderate risk for depression for 16 (17%) mothers (Radloff, 1977). Thirty-one mothers (34% of the sample) had PSWQ

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scores at or above the 80th percentile based on normative values (Gillis, Haaga, & Ford, 1995). Notably, a modest negative correlation existed between the parenting dimensions, suggesting the mothers were unlikely to score extremely high or low on both dimensions. We examined all variables for normality prior to analyses and found that they all adhered reasonably well to a normal distribution (all skew and kurtosis values fell between −1.00 and 1.00).

Primary Analyses

For primary analyses, we wanted to retain individual predictions and behaviors rather than forming an aggregate across them to account for potential variability within and across episodes. Using all observations also provided more power by increasing degrees of freedom (35 prediction/behavior observations for each of the 117 mothers and toddlers = 4095 observations). We used three-level multilevel models, which structured analyses in a way that accounted for the nesting of predictions and behaviors (Level 1) within episodes (Level 2) and individuals (Level 3) and accommodated the resultant non-independence of observations (Raudenbush & Bryk, 2002). Because maternal symptoms and parenting dimensions were characteristics of the mother and would not vary across episodes or individual predictions, they were Level 3 variables. Parameter coefficients in these models can be interpreted like regression coefficients. Multilevel models were run using the proc mixed procedure in SAS 9.1.

Relations of maternal symptoms and parenting dimensions to maternal predictions—We first examined how maternal symptoms and parenting dimensions related to the dependent variable of maternal predictions. Depressive symptoms, worry symptoms, authoritative-responsive parenting, authoritarian parenting, and the interactions between each maternal symptom and each of the parenting dimensions were entered simultaneously as predictors. Variables were centered prior to analyses to aid in interpretation and reduce multicolinearity. Because we hypothesized specific interactions, and consistent with recommendations for regression analyses (Aiken & West, 1991), we examined models in a top-down fashion. Model fit did not improve over a model with no predictors, χ^2 (8) = 0.03, *ns*, and no interaction effects were significant (all *p*s > .10), so interaction terms were dropped and the model was re-run to examine main effects.

A main effects model (Table 2) did not result in an improvement in model fit over a model with no predictors. One main effect and a marginal main effect emerged in this model. Worry symptoms demonstrated a negative relation to maternal predictions. Mothers who reported more worry symptoms predicted their toddlers to show more wary behavior in the laboratory tasks. In this model, a trend also emerged for mothers to expect more wary behavior from their toddlers when they reported higher authoritarian parenting, although the marginal nature of this relation prevents confident conclusions from being asserted.

Symptoms, parenting dimensions, and accuracy—Next, we examined how internalizing symptoms and parenting dimensions moderated the relation between maternal predictions about toddler behavior and toddlers' actual behaviors (i.e., the accuracy of predictions). Each maternal prediction was an independent variable relating to the specific corresponding toddler behavior as the dependent variable. For example, "Will your child want to stay close to you?" in one episode was the independent variable for the dependent variable of "Proximity to mother" in that particular episode. Interaction terms were created among predictions, symptom scales, and parenting dimensions by multiplying terms together. Thus, three-level multilevel models assessed how maternal symptoms and parenting dimensions moderated the relation between maternal predictions and toddler behaviors (i.e., related to maternal accuracy).

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As a lower-level independent variable, maternal prediction may have both fixed and random components. The existence of a random component for the maternal prediction variable would be particularly important to identify at Level 3 in our analyses because that would suggest that the relation between predictions and behaviors varied across different dyads. To assess the fit of random components, we examined the −2 log likelihood as an indicator of model fit for models containing random components at Level 2, Level 3, or both, compared to a model with no random components. The best fit (i.e., lowest value of −2 log likelihood) occurred when random effects were allowed at both levels, χ^2 (4) = 29.00, $p < .01$. Thus, we included random components of maternal prediction in further models, although fixed effects were of primary interest for remaining analyses. In this model, maternal predictions significantly related to toddler behavior, $\pi = 0.08$, t (3971) = 4.66, $p < .001$. In general, mothers predicted their toddlers' reactions with relative accuracy.

The next models examined the interactive effects of maternal symptoms and parenting dimensions on accuracy. Each model included a 3-way interaction among maternal prediction, a symptom scale, and a parenting dimension; the lower-order 2-way interactions; and the main effects. Again, all predictors were entered simultaneously and examined in a top-down manner. To avoid splitting the sample and making categorical variables out of what we theorized to be continuous variables, simple effects within significant interactions were examined by computing simple slopes of maternal prediction at recentered values (*low* = −1 SD, *mean*, *high* = +1 *SD*) of the moderating variables (Aiken & West, 1991). For the sake of brevity, the highest model with significant terms is presented.

Maternal depressive symptoms—The first model examined maternal depressive symptoms and authoritative-responsive parenting (Table 3). The three-way interaction was significant and was probed to determine how the Prediction × Depressive symptoms interaction changed across values of authoritative-responsive parenting (see Figure 1). At low responsiveness, a negative interaction existed between predictions and depressive symptoms, $t(3968) = -2.43$, $p < .05$. This interaction was probed further by recentering depressive symptoms at low, mean, and high values to calculate simple slopes for the relation between maternal predictions and behaviors, maintaining the centering of authoritative-responsive parenting at −1 *SD*. Maternal predictions significantly related to toddler behaviors at low, $\pi = 0.15$, $t(3968) = 3.71$, $p < .001$, and mean depressive symptoms, $\pi = 0.08$, $t(3968) = 3.16$, $p < .01$, but not at high depressive symptoms. The Prediction × Depressive symptom interaction was not significant at mean or high authoritative responsiveness (ps > .10). Thus, only when mothers endorsed lower levels of authoritative-responsive parenting did increasing depressive symptoms relate to lower accuracy of mothers' expectations for toddlers' responses to novelty.

The next model examined depressive symptoms, authoritarian parenting, and maternal predictions. In a main effects model (Table 3), only maternal prediction related to toddler behavior.

Maternal worry symptoms—The first model assessed worry, authoritative-responsive parenting, and maternal predictions. In a model of main effects, $\chi^2(5) = 43.20$, $p < .01$, maternal prediction significantly related to toddler behavior, $\pi = 0.08$, $t(3971) = 4.67$, $p < .001$, and worry symptoms showed a trend towards relating to toddler behavior, $\pi = 0.12$, $t(114) = 1.71$, $p < .10$.

In the model with authoritarian parenting, a similar result occurred. In a main effects model, χ^2 (5)= 44.30, $p < .01$, maternal prediction related to toddler behavior, $\pi = 0.08$, $t(3971) = 4.69$, $p < .001$, and worry had a marginal relation to toddler behavior, $\pi = 0.11$, $t(114) = 1.68$, $p < .10$.

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DISCUSSION

The current study examined whether internalizing symptoms and parenting dimensions related to the intensity and accuracy of maternal expectations for toddlers' distress to novelty. Maternal worry and authoritarian parenting (as a trend) related to expectations for increased toddler wariness in the laboratory. Depressive symptoms moderated the relation between maternal expectations and toddlers' observed behaviors: Mothers with more depressive symptoms displayed lower accuracy, but only when they endorsed lower authoritative-responsive parenting. Otherwise, internalizing symptoms did not moderate mothers' accuracy.

Worry and, to a lesser extent, authoritarian parenting related to increased expectations for toddlers' wary behavior, but they did not relate to accuracy. These results are consistent with previous findings that these characteristics relate to more negative reports of children's behavior, but mothers with higher levels of worry and authoritarian parenting were no more or less accurate than other mothers. Perhaps these are not biases; child behavior may vary systematically with these characteristics. Mothers who reported more worry, in fact, had toddlers who displayed more wariness in the laboratory. Shared genetics (e.g., Warren, Schmitz, & Emde, 1999) or anxious socialization (e.g., Dadds & Roth, 2001) may account for this association. Children's wariness may also evoke worry in mothers. Authoritarian parenting has been linked to fearfulness in children (Mills, 1998), perhaps through rejection, arbitrary responsiveness, and expression and dysregulation of negativity (Martini, Root, & Jenkins, 2004). Because these data are correlational, we cannot conclude directionality. Nevertheless, it is informative that, although related to expectations, maternal worry and authoritarian parenting did not relate to the accuracy of expectations.

Authoritative-responsive parenting interacted with depressive symptoms and expectations in relation to toddlers' behaviors. As mothers described themselves as less responsive, depressive symptoms increasingly moderated accuracy such that expectations were less related to toddlers' observed behaviors at higher levels of depressive symptoms. Another interpretation is that, at higher authoritative-responsive parenting, depressive symptoms no longer relate to changes in accuracy. This suggests that, unless they are also low in authoritative-responsive parenting, mothers with more depressive symptoms can be as accurate as less depressed mothers.

Why would variation in authoritative-responsive parenting, in particular, moderate accuracy? Recall that the authoritative-responsive parenting dimension assessed behaviors indicative of underlying attitudes and beliefs and a child-focused orientation. Responsiveness characteristic of authoritative parenting requires a mother to focus on her child and to be flexible for the situation (Baumrind, 1971, Robinson et al., 1995), allowing more symptomatic mothers to be as attuned to their toddlers as less symptomatic mothers. When parents become less focused on their children's learning and development, symptoms may interfere with the accuracy of expectations. Examining authoritative-responsiveness parenting dimensionally revealed that these mothers may not even need to typify the characteristic authoritative style; rather, even moderate levels of authoritative-responsive parenting may protect against deficits in accuracy related to depressive symptoms.

The lack of relation between depressive symptoms and maternal accuracy at higher levels of authoritative-responsive parenting differs from previous studies, perhaps for methodological reasons. Specifically, depressive symptoms could bias mothers' perceptions in broader terms, as assessed on a temperament questionnaire; however, when pressed to answer specific questions about impending behavior, this bias disappears unless other characteristics (e.g., low responsiveness) are present. We do not suggest that maternal report is therefore a less useful tool in general, but rather that other methodologies, such as the one used here, may allow for

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better agreement with laboratory observation. In addition, using multiple tasks to assess expectations may have resulted in a stronger relation between maternal expectations and observed toddler behavior than would occur for a maternal report questionnaire and laboratory observation.

The methodology utilized to examine accuracy provided the same context of assessment of toddler behaviors to both mothers and laboratory observers. Previous research has asked mothers to report on behavior they see at home or in other situations that might differ greatly from a laboratory setting (Richters, 1992). The current study extends the recent effort to avoid this confound (e.g., Seifer et al., 1994). Of course, we cannot draw conclusions about the unique effects of the laboratory tasks on toddlers' behaviors compared to naturalistic settings, or about how these maternal expectations generalize to other situations. However, assessing maternal expectations for toddlers' behavior in new situations was purposeful. This allowed us to examine how mothers anticipate their children's behavior, in contrast to other recent methodologies used to assess maternal accuracy for describing past behavior (Coyne et al., 2007; Schuetze & Zeskind, 2001; Youngstrom et al., 1999). The ability to anticipate children's fearfulness may prompt more sensitive, contingent behavior with children in general (Davidov & Grusec, 2006; Hastings & Grusec, 1997) or overprotective behaviors with temperamentally fearful children (Kiel & Buss, in press). Future assessments of the predictive validity of maternal expectations and accuracy would clarify the utility of this methodology.

Limitations and Future Directions

The correlational nature of the data precludes conclusions about the causal directions between mothers' internalizing symptoms and parenting dimensions, on the one hand, and maternal expectations and accuracy, on the other. For example, lower levels of authoritative-responsive parenting and higher levels of depression could cause mothers to be less accurate. On the other hand, it cannot be ruled out that expecting children to be more or less fearful (and being more or less accurate) influenced mothers to be more depressed or less responsive. Longitudinal examinations of influences among maternal expectations, children's observed reactions to novelty, and maternal parenting dimensions would not only elucidate this specific issue, but also augment theoretical conceptualizations of how mothers and children influence each other over time, a primary goal of studies of developmental psychopathology (Rutter & Sroufe, 2000).

We assessed accuracy as the relative association between maternal expectations and toddler behaviors, which is not absolute accuracy. Although the specific questions provided room for variance (i.e., "Probably" or "Definitely"), future studies could ask mothers open-ended questions about their toddlers' behaviors (e.g., "How close will your child approach?" rather than "Will your child approach?"). The reliability of absolute accuracy and whether it differentially relates to maternal characteristics could be examined in future work. The cognitive processes involved in forming expectations might differ between mothers from a community sample as in the current study and mothers diagnosed with affective or anxiety disorders. Repeating these procedures with mothers chosen from a clinical population would help to answer questions about possible differences.

Finally, our sample was, on average, European American and middle-class, so results may not be generalizable across families from different socioeconomic or cultural backgrounds. Although authoritative parenting may be considered the "norm" for European American, middle-class families in the United States, other cultures have different views about parenting, and children in different environments may react differently to different types of parenting. Future research could sample from different populations to examine relations between maternal internalizing symptoms and parenting dimensions and mothers' accuracy in predicting their children's responses to novelty.

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Conclusions

Internalizing symptoms and parenting dimensions may have associations with how mothers perceive their children's behavior. Except in the case of being low in authoritative-responsive parenting, when depressive symptoms may indeed hinder the accuracy of mothers' appraisals, variation in expectations may reflect actual differences in children's behavior. This finding was strengthened by providing mothers with the same context as laboratory observation and examining expectations for future behavior. Including these components in future studies may further elucidate how maternal internalizing symptoms and parenting practices affect the accuracy of maternal expectations for children's fearful behavior.

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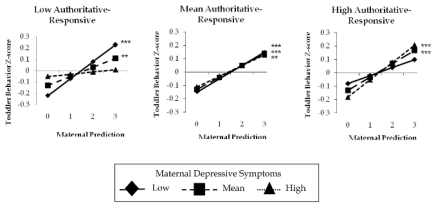

Figure 1.

As mothers reported lower scores on the authoritative-responsive parenting dimension, depressive symptoms moderated the relation between maternal expectations and observed toddler behavior. Maternal expectations related to toddler behavior at lower levels of maternal depressive symptoms, but the association was non-significant when mothers reported higher levels of depressive symptoms.

$^{**}p < .01$, $^{***}p < .001$.

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TABLE 1

Descriptive Statistics and Bivariate Relations

Variable	*M* (*SD*)	*Range*	2	3	4
1. Depressive symptoms	0.48 (.27)	0.00 – 1.35	.19*	−.18	.24**
2. Worry symptoms	2.87 (.65)	1.25 – 4.31	-	.14	−08
3. Authoritative-responsive parenting	3.88 (.44)	2.52 – 4.70	-	-	−.21*
4. Authoritarian parenting	1.79 (.27)	1.19 – 2.56	-	-	-

Note. Statistics are provided for variables after imputation of missing data.

* $p < .05$

** $p < .01$.

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TABLE 2

Relations of Symptoms and Parenting Dimensions to Maternal Predictions

Fixed Effects	Coefficient (SE)	*t*-value
Intercept	1.25	38.05***
Depressive symptoms	−0.18	−1.39
Worry symptoms	0.18	3.43***
Authoritative-responsive parenting	0.04	0.54
Authoritarian parenting	0.21	1.68

Note. Model fit: Δ −2 log likelihood, $\chi^2(5) = 2.10$, *ns*. Random effects included the intercept at levels 1 and 2 and the residual variance (all *z*s > 3.00, all *p*s < .001).

*** $p < .001$.

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TABLE 3

Relations of Depressive Symptoms, Parenting Dimensions, and Predictions to Toddler Behavior

	Authoritative-Responsive Parenting		Authoritarian Parenting	
Fixed Effect	**Coefficient (*SE*)**	***t*-value**	**Coefficient (*SE*)**	***t*-value**
Intercept	−0.13 (.04)	−2.90**	−0.12 (.04)	−2.64**
Maternal prediction	0.09 (.02)	5.05***	0.08 (.02)	4.68***
Depressive symptoms	0.07 (.16)	0.43	0.07 (.17)	0.44
Parenting dimension	0.01 (.10)	0.05	−0.09 (.17)	−0.52
Pred × Depressive	−0.05 (.06)	−0.71		
Pred × Parenting	0.01 (.04)	0.31		
Depressive × Parenting	−0.56 (.37)	−1.54		
Pred × Dep × Parenting	0.41 (.15)	2.79**		

Note. Model fit: χ^2 (9) = 41.20, $p < .01$ for authoritative model, χ^2 (5) = 42.86, $p < .01$ for authoritarian model.

** $p < .01$,

*** $p < .001$.

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APPENDIX

Maternal Predictions and Corresponding Toddler Behaviors

Episode	Prediction ("Will your child…")	Behavior
SA	Smile at or greet the stranger?	Intensity of greeting
SA	Approach the stranger?	Boldness
SA	Cry or fuss?	Distress vocalizations
SA	Want to be held by you?	Attempt to be held
SA	Want to stay close to you?	Proximity to mother
SA	Be upset during stranger	Distress after stranger's questions
SA	Answer the stranger's questions?	Proportion of responses to questions
SA	Be wary/fearful of the stranger?	Shyness
R	Approach the robot?	Boldness
R	Want to stay close to you?	Proximity to mother
R	Want to be held by you?	Attempt to be held
R	Play with the robot?	Intensity of play
R	Be wary/fearful of the robot?	Shyness
R	Cry or fuss?	Distress vocalizations
PS	Approach the puppets?	Boldness
PS	Want to stay close to you?	Proximity to mother
PS	Want to be held by you?	Attempt to be held
PS	Play all the games with the	Number of games played
PS	Talk with the puppets?	Number of vocalizations directed at puppets
PS	Be wary/fearful of the puppets?	Shyness
PS	Be willing to help the puppets?	Willingness to help puppets
PS	Cry or fuss?	Distress vocalizations
C	Approach the clown?	Boldness
C	Want to stay close to you?	Proximity to mother
C	Want to be held by you?	Attempt to be held
C	Play all the games with the clown?	Number of games played
C	Be wary/fearful of the clown?	Shyness
C	Talk to the clown?	Number of vocalizations directed at clown
C	Cry or fuss?	Distress vocalizations
S	Approach the spider?	Boldness
S	Want to stay close to you?	Proximity to mother
S	Want to be held by you?	Attempt to be held
S	Play with the spider?	Intensity of play
S	Be wary/fearful of the spider?	Shyness
S	Cry or fuss?	Distress vocalizations

Note. SA = Stranger Approach, R = Robot, C = Clown, PS = Puppet Show, S = Spider.