

# Cognitive, Affective, and Behavioral Characteristics of Mothers With Anxiety Disorders in the Context of Child Anxiety Disorder

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Parental emotional distress, particularly high maternal anxiety, is one of the most consistent predictors of child anxiety treatment outcome. In order to identify the cognitive, affective, and behavioral parenting characteristics of mothers of children with anxiety disorders who themselves have an anxiety disorder, we assessed the expectations, appraisals, and behaviors of 88 mothers of anxious children (44 mothers who were not anxious [NONANX] and 44 mothers with a current anxiety disorder [ANX]) when interacting with their 7–12-year-old children. There were no observed differences in anxiety and avoidance among children of ANX and NONANX mothers, but, compared with NONANX mothers, ANX mothers held more negative expectations, and they differed on observations of intrusiveness, expressed anxiety, warmth, and the quality of the relationship. Associations were moderated by the degree to which children expressed anxiety during the tasks. Maternal-reported negative emotions during the task significantly mediated the association between maternal anxiety status and the observed quality of the relationship. These findings suggest that maternal anxiety disorder is associated with reduced tolerance of children's negative emotions. This may interfere with the maintenance of a positive, supportive mother-child interaction under conditions of stress and, as such, this may impede optimum treatment outcomes. The findings identify potential cognitive, affective, and behavioral targets to improve treatment outcomes for children with anxiety disorders in the context of a current maternal anxiety disorder.

*Keywords:* child, anxiety, mother, cognitions, behavior, affect

Anxiety disorders are among the most common psychological difficulties in childhood (e.g., Canino et al., 2004; Ford, Goodman, & Meltzer, 2003). They impact substantially on children's functioning in family, social, and academic domains (e.g., Ezpeleta, Keeler, Erkanli, Costello, & Angold, 2001), and they are associated with substantial health and social costs (e.g., Boddien, Dirksen, & Bögels, 2008). Randomized controlled trials have consistently shown that cognitive-behavioral treatments are effective for childhood anxiety disorders, with 55% to 60% of children no longer meeting criteria for an anxiety disorder following treatment (e.g., Cartwright-Hatton, Roberts, Chitsabesan, Fothergill, & Harrington, 2004; James, Soler, & Weatherall, 2007). Research into

factors that predict treatment outcome is at an early stage, but one of the most consistent predictors of child anxiety treatment response is parental emotional distress, in particular, parental anxiety (e.g., Boddien, Bögels, et al., 2008; Cobham, Dadds, & Spence, 1998; Cooper, Gallop, Willetts, & Creswell, 2008; Crawford & Manassis, 2001; Silverman, Kurtines, Pina, & Jaccard, 2009). This association is important as rates of anxiety disorder among parents of anxious children have been found to be substantial in clinic populations, especially among mothers (e.g., Cooper, Fearn, Willetts, Seabrook, & Parkinson, 2006; Last, Hersen, Kazdin, Francis, & Grubb, 1987). In order to improve treatment outcomes for anxious children, a better understanding of the mechanisms by which parent anxiety maintains child anxiety is required. A necessary first step in this process is to obtain a clear understanding of the nature of the affective, cognitive, and behavioral characteristics of anxious (compared with nonanxious) parents of clinically anxious children when interacting in challenging situations.

Models of the development and maintenance of childhood anxiety disorders have proposed that particular cognitive, affective, and behavioral features of parent-child interactions maintain children's anxiety problems (e.g., Creswell, Murray, Stacey, & Cooper, 2011). These models reflect findings that, compared with parents of nonanxious children, parents of anxious children have been found to expect that their children's responses will be characterized by threat interpretation, negative emotions, and low control (e.g., Barrett, Rapee, Dadds, & Ryan, 1996; Creswell, Schneiring, & Rapee, 2005; Kortlander, Kendall, & Panichelli-Mindel, 1997; Micco & Ehrenreich, 2008); and they view themselves as having less control over their child's responses (Wheat-

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croft & Creswell, 2007). This negative cognitive style is hypothesized to drive parental emotions and behaviors that promote child anxiety by increasing parental-expressed anxiety and transference of threat-related information to the child, and limiting child autonomy (Creswell et al., 2011; Hudson & Rapee, 2004; Lester, Field, Oliver, & Cartwright-Hatton, 2009). Empirical research has supported this account, in that studies have shown that parental fear expression, transfer of fear-relevant information, and lack of parental autonomy granting are a feature of parents of anxious, compared with nonanxious children (e.g., McLeod, Wood, & Weisz, 2007), and there is some experimental and longitudinal evidence for a role of each of these dimensions in the maintenance of child anxiety (e.g., de Rosnay, Cooper, Tsigaras, & Murray, 2006; de Wilde & Rapee, 2008; Field & Lawson, 2003; Murray et al., 2008; Thirlwall & Creswell, 2010). It remains unclear, however, whether these cognitive, affective, and behavioral parenting styles, which promote anxiety in children, are enhanced when parents themselves are also anxious. Clarification of this matter is important, as it is likely to have direct implications for improving treatment outcomes for anxious children in the context of parental anxiety. Studies that have assessed the cognitions, affect, and behaviors of anxious parents have typically examined associations within nonclinical populations (e.g., Lester et al., 2009; van der Bruggen, Bögels, & van Zeilst, 2010; Wheatcroft & Creswell, 2007), or among anxious parents recruited on the basis of their own (and not their child's) clinical status (e.g., Ginsburg, Grover, & Ialongo, 2004; Murray, Cooper, Creswell, Schofield, & Sack, 2007; Turner, Beidel, Roberson-Nay, & Tervo, 2003; Woodruff-Borden, Morrow, Bourland, & Cambron, 2002). Few have examined the parent-child relationship in the context of anxiety disorders in both generations. This specific examination is important as it appears that the phenomenon of high parental anxiety leading to increased anxiogenic parental responses may be especially salient when children themselves are also highly anxious (Hirshfeld, Biederman, Brody, Faraone, & Rosenbaum, 1997).

In relation to parental expectations, Cobham and Dadds (1999) found that parents with high trait anxiety expected their children (all with anxiety disorders) to be more anxious and avoidant in a stressful task than nonanxious parents, despite the children themselves not differing in their predictions of their performance. No studies have specifically examined the affective responses of anxious versus nonanxious parents in interaction with anxious children; notably, however, Turner et al. (2003) found that anxious parents, compared with nonanxious parents (of unselected children), reported higher peak levels of distress when interacting with their child in a risky play setting. In relation to parental behaviors, two studies have used designs which included both anxious and nonanxious parents of anxious children. Moore, Whaley, and Sigman (2004) observed interactions during discussions about conflict and anxiety situations, and they found that, compared to when only one or neither of a mother-child dyad were anxious, when *both* mother and child were anxious, there was a higher frequency of maternal catastrophizing comments, although there were no group differences in autonomy promotion or warmth. Gar and Hudson (2008), using a similar design, also found no significant effects of maternal anxiety, either independently or in interaction with child anxiety status, on measures of involvement and negativity during a speech preparation task and Five Minute Speech Sample. How-

ever, as noted by Murray et al. (2012), the findings of these studies need to be considered in the light of methodological issues relating to the assessment and coding schemes applied, since these may account for the lack of group differences. First, it appears that assessment tasks that invoke negative emotions in the child elicit more intrusive behaviors among anxious, compared with nonanxious, mothers (Hudson, Comer, & Kendall, 2008). Second, stronger associations between parental anxiety and controlling behaviors are found with more precisely defined parental behaviors, compared with more general categories; and with performance, rather than discussion-based tasks (Murray et al., 2012; van der Bruggen, Stams, & Bogels, 2008). Thus, where previous studies have failed to find differences between anxious and nonanxious parents, it is unclear whether this is a result of the use of overly general behavioral codes based on interactions in which the child is not directly challenged. The current study examined cognitive, affective, and behavioral characteristics of anxious and nonanxious mothers of clinically anxious children, taking account of the methodological issues regarding assessment methods and coding frames outlined above. First, we wanted to be sure that the tasks we used would, in fact, elicit anxiety among the participating children. Thus, since children with anxiety disorders present with a range of different forms of anxiety, we observed mother-child interactions under three conditions designed to elicit child anxiety across a range of domains: that is, a social-anxiety provoking task, a performance anxiety provoking task, and a physical threat task (see procedure below for details). Second, we extended previous research with clinical samples by considering parental expectations regarding their children's responses to each task in terms of the child's performance, negative emotions, and sense of control, as well as the parent's expectations regarding their own feelings and perceived control when interacting with their child. Third, we included parents' postevent ratings regarding their children's and their own responses; these are of interest as performance ratings have been found to be more negative among anxious compared with nonanxious adults following the experience of a stressor (e.g., Abbott & Rapee, 2004; Clark & Wells, 1995). Fourth, in order to assess parental behaviors, we adapted a coding scheme from Murray et al. (2012) that considered specific dimensions of behavior, informed by the wider literature (McLeod et al., 2007; Murray et al., 2007, 2008; van der Bruggen et al., 2008). Finally, we also observed child anxiety and avoidance, and we examined its effects on parental behaviors. Since child age and gender are likely to influence parental cognitions and behaviors (e.g., Dix, Ruble, Grusec, & Nixon, 1986), we selected groups balanced on these factors, and we considered their influence in all analyses. In addition, we took account of parental mood disturbance, as it is commonly comorbid with anxiety (e.g., Sartorius, Bedirhan, Lecrubier, & Wittchen, 1996), and it is associated with negative parental cognitions (e.g., Chen, Johnston, Sheeber, & Leve, 2009) and behaviors (e.g., Lovejoy, Graczyk, O'Hare, & Neuman, 2000).

The following hypotheses were examined among mother-child dyads in which all children met diagnostic criteria for a current anxiety disorder:

- (1) Compared with nonanxious mothers, mothers with a current anxiety disorder will report more negative (pre-task) expectations regarding their child's responses to a series of challenging tasks (specifically, they will antic-

ipate that the child will have more negative feelings, poorer performance, and reduced control, and that they themselves will experience more negative feelings and a reduced sense of control);

- (2) Compared with nonanxious mothers, mothers with a current anxiety disorder will give more negative (post-task) appraisals (in terms of their child's and their own responses); this difference will be particularly likely when children express high levels of anxiety during the task;
- (3) Compared with nonanxious mothers, mothers with a current anxiety disorder will display increased fear when interacting with their children, communicate more fear-relevant information, and promote less autonomy; again, this difference will be particularly likely when children express high levels of anxiety during the task;
- (4) The expectations and evaluations that are characteristic of anxious parents of anxious children, delineated above, will mediate any group differences in parental behaviors.

## Method

### Participants

Eighty-eight clinically anxious children, aged 7–12 years-old, and their mothers (who were all the children's primary caretakers) took part in the study before commencing treatment. For 44 of the children, their mothers also fulfilled diagnostic criteria for a current anxiety disorder (ANX), and for 44 of the children, their mothers did not fulfill diagnostic criteria for a current anxiety disorder (NONANX). The groups were well balanced on age, gender, ethnicity, and socioeconomic status (see Table 1). All participating children were recruited through referrals by local health and education service personnel to the Berkshire Child Anxiety Clinic at the University of Reading. Children were assessed by graduate psychologists using the Anxiety Disorders Interview Schedule for *DSM-IV*: Child and Parent version (ADIS: C/P, see below), and they were included on the basis of having an

anxiety disorder as their principal diagnosis. Principal anxiety disorders by group (ANX; NONANX) were as follows: social phobia (14%; 11%), separation anxiety disorder (27%; 27%), specific phobia (14%; 20%), agoraphobia without panic disorder (5%; 5%), generalized anxiety disorder (32%; 32%), and anxiety disorder not otherwise specified (5%; 5%). The mean number of anxiety diagnoses were 2.91 ( $SD = 1.49$ ) for the ANX group and 2.45 ( $SD = 1.25$ ) for the NONANX group. The ANX and NONANX groups did not differ significantly on children's mean number of anxiety disorders,  $t(86) = 1.55, p = .13$ , or on child or mother-reported anxiety symptoms, as assessed by the Spence Children's Anxiety Scale—child and parent versions (see Table 1).

Groups were allocated on the basis of mothers' responses to the Anxiety Disorders Interview Schedule for *DSM-IV* concerning their own current mental state. Mothers in the ANX group were included on the basis of having an anxiety disorder as their principal diagnosis. Principal anxiety disorders of mothers in this group were as follows: generalized anxiety disorder (57%), social phobia (18%), specific phobia (18%), agoraphobia without panic disorder (5%), and obsessive compulsive disorder (2%). Mean number of anxiety diagnoses were 2.05 ( $SD = .99$ ; mothers were not included if they only met criteria for a specific phobia). The NONANX group was included on the basis of not meeting criteria for a current anxiety disorder. As expected, mothers in the ANX and NONANX groups differed significantly on self-reported anxiety symptoms on the Anxiety Scale of the DASS-21 (see below),  $t(86) = 4.98, p < .001$ . They also differed significantly on self-reported level of depressed mood, assessed with the depression subscale of the DASS-21,  $t(86) = 5.67, p < .001$ , see Table 1.

### Procedure

Mothers and children completed initial diagnostic interviews and symptom questionnaires either in university clinic rooms or in satellite clinics in their locality. All children were assisted in completing questionnaires by a researcher in order to overcome any difficulties associated with the children's reading levels. For all families, the research assessment was conducted in a university laboratory fitted with CCTV-style cameras. Following a 10-min task to get settled in to the lab (a familiar game, "Connect Four"), mothers completed questionnaires (see below) in a separate room

Table 1  
Sample Characteristics

	Anxious mothers ( $N = 44$ )	Nonanxious mothers ( $N = 44$ )	
Age (mean, $SD$ )	119.97 (15.47)	116.73 (19.16)	$t(86) = .88, p = .38$
Gender (% [n] female)	61.40 (27)	59.10 (26)	$\chi^2(1) = .05, p = .83$
Family SES % (n) "Higher professional"	61.36 (27)	70.45 (31)	$\chi^2(1) = .81, p = .37$
Ethnicity % (n) White British	84.09 (37)	79.55 (35)	$\chi^2(1) = .31, p = .58$
SCAS-c Total (mean, $SD$ )	43.05 (19.94)	39.07 (15.88)	$t(86) = 1.04, p = .30$
SCAS-p Total (mean, $SD$ )	39.06 (14.45)	36.93 (18.64)	$t(75) = .55, p = .58$
SDQ --p Conduct problems (mean, $SD$ )	3.07 (1.78)	3.07 (1.78)	$t(85) = 1.09, p = .28$
SMFQ-c (mean, $SD$ )	7.82 (4.93)	7.93 (5.90)	$t(86) = .10, p = .92$
DASS Anxiety (mean, $SD$ )	8.41 (7.58)	2.36 (2.74)	$t(86) = 4.98, p < .001$
DASS Depression (mean, $SD$ )	12.23 (8.80)	3.77 (4.53)	$t(86) = 5.67, p < .001$

Note. SES: Socioeconomic Status; SCAS-c = Spence Children's Anxiety Scale-child report; SCAS-p = Spence Children's Anxiety Scale-parent report; SDQ-p = Strengths and Difficulties Questionnaire-parent report; SMFQ-c = Short Mood and Feelings Questionnaire-child report; DASS = Depression Anxiety and Stress Scale (mother self-report).

from their child. Mothers then rejoined their child, and the three tasks were administered, separated by 5-min relaxation periods (when the mother and child watched a children's DVD together). As noted, the three challenge tasks comprised a social challenge, a performance challenge, and a physical challenge task. In the social task, children were asked to give a presentation to a video camera on a tripod manned by a research assistant. Children were told that they would be asked to give a short presentation to the video camera of between 3 and 5 mins in length. Children were given a choice of topics to talk about ("My hobbies," "My ideal day," "My family," "My favorite holiday"), and they were told that they would be left for 5 min to prepare, with their mother's support, and they would then be asked to give the speech to the camera. For the performance task, the "tangram" puzzles, children were asked to place geometric pieces together to form larger shapes that were outlined on a set of templates. The procedure followed Hudson and Rapee (2001), and it involved presenting tangrams suitable for older children, giving a 5-min time limit, and informing parents that this was a test of their child's thinking ability. In the physical challenge task, children were presented with a black box with a hole in each of its four sides, obscured by a black curtain. Children were told that there were four "scary items" in the black box, and they were invited to find out what was inside. The box contained four fluffy or squidgy toys. Mothers were present with their child throughout all the tasks, and they were instructed to help their child in whatever way they felt was appropriate. Maternal expectations and evaluations regarding their child's and their own responses were assessed within each task using rating scales immediately before and after each task (see below).

## Measures

**Structured diagnostic interviews with children and parents.** Children were assigned diagnoses on the basis of the Anxiety Disorders Interview Schedule for *DSM-IV* for Children- Child and Parent Versions (ADIS-C/P; Silverman & Albano, 1996), a structured diagnostic interview with well-established psychometric properties (Silverman, Saavedra, & Pina, 2001). The presence or absence of a current maternal anxiety disorder diagnosis was assigned on the basis of the Anxiety Disorders Interview Schedule for *DSM-IV* (ADIS-IV; Brown, DiNardo, & Barlow, 2004). In both cases, where individuals met symptom criteria for a diagnosis, they were assigned a clinical severity rating (CSR) ranging from 0 (*complete absence of psychopathology*) to 8 (*severe psychopathology*). As is conventional, only those who met symptom criteria with a CSR of 4 or more (moderate psychopathology) were considered to meet diagnostic criteria. For the ADIS-C/P, as is standard, overall diagnoses and CSRs were assigned if the child met diagnostic criteria on the basis of either child or parent report, and the higher CSR of the two was taken. Assessors (psychology graduates) were trained on the administration and scoring of the ADIS and ADIS-C/P through verbal instruction, listening to assessment audio recordings, and participating in diagnostic consensus discussions. The first 20 interviews conducted were then discussed with a consensus team, led by an experienced diagnostician (Consultant Clinical Psychologist). The assessor and the consensus team independently allocated diagnoses and CSRs. Following the administration of 20 child, 20 parent interviews or 20 adult interviews, interrater reliability for each assessor was

checked, and if assessors achieved reliability of at least .85, they were then required to discuss just one in six interviews with the consensus team (these ongoing checks were conducted to prevent interrater drift). Overall reliability for the team was excellent. As different assessors interviewed the parent and child simultaneously, reliability figures for parent and child report were calculated separately. Reliability for presence or absence of diagnosis on the ADIS-C/P was  $\kappa = .98$  (child report), .98 (mother report); and for the CSR intraclass correlation = .99 (child report), .99 (mother report). Reliability for presence or absence of maternal diagnosis on the ADIS was  $\kappa = .97$ ; and for the CSR intraclass correlation = .99.

**Questionnaires.** Questionnaire measures were used to confirm differences and similarities between the two groups and to identify potential confounds. The Spence Children's Anxiety Scale (SCAS-c/p; Nauta et al., 2004; Spence, 1998) assessed child and parent-reported child anxiety symptoms. The child version requires children to rate how often they experience each of 38 anxiety symptoms, presented alongside six positive filler items. The SCAS-C has demonstrated concurrent validity with other well-known anxiety measures (Spence, 1998), and robust psychometric properties with children from 7 years of age (Muris, Schmidt, & Merckelbach, 2000). Internal reliability in the current data set was high (child report,  $\alpha = .89$ ; parent report,  $\alpha = .91$ ). The Short Mood and Feelings Questionnaire (SMFQ-c; Angold et al., 1995) assessed child-reported symptoms of low mood. The SMFQ-c is a brief, 13-item measure which requires children to report how often in the past 2 weeks they have experienced a number of symptoms. The SMFQ-c has demonstrated high concurrent validity with other well-known measures of symptoms of depression (Angold et al., 1995) and has robust psychometric properties with children from 7 years of age (Sharp, Goodyer, & Croudace, 2006). Internal reliability in the current dataset was high ( $\alpha = .87$ ). The conduct problems scale from the Strengths and Difficulties Questionnaire (SDQ-p; Goodman, 1997) was used to assess parent-reported behavioral disturbance. The SDQ-p is validated for parent report on children aged 4 to 16 years. It is known to have good psychometric properties, and scores correlate highly with other well-known scales (Goodman, 1997); internal validity in the current dataset was acceptable ( $\alpha = .68$ ). The Depression Anxiety and Stress Scales (DASS-21; Lovibond & Lovibond, 1995) were administered to all participating mothers, and the depression and anxiety scales were used here. The DASS-21 has demonstrated good internal consistency and concurrent validity (Antony, Bieling, Cox, Enns, & Swinson, 1998). In the current study, internal reliability was high (DASS Anxiety,  $\alpha = .82$ ; DASS Depression,  $\alpha = .90$ ).

**Task expectations and evaluations.** Parents' expectations were assessed before initiating the challenge tasks. Immediately after receiving the instructions for each task, mothers were taken to a separate room, and they were asked to provide ratings regarding their child's and their own responses as follows: (a) how their child would feel about doing the task (0 = *not scared at all*, 10 = *extremely scared*); (b) how well they thought their child would do the task (0 = *not well at all*, 10 = *extremely well*); (c) how much their child could do about how the task went (0 = *nothing at all*, 10 = *a lot*); (d) how they would feel while their child was doing the task (0 = *not anxious*, 10 = *extremely anxious*); (e) how much they would be able to make a difference in their child's feelings

about doing the task (0 = *not at all*, 10 = *a lot*); and (f) how much they would be able to make a difference in how well their child did the task (0 = *not at all*, 10 = *a lot*).

Immediately following each task, mothers were asked to complete a further set of ratings regarding their evaluations of how the task went. Specifically, they were asked to rate their child's (a) feelings (0 = *not scared at all*, 10 = *extremely scared*); (b) performance (0 = *not well at all*, 10 = *extremely well*); and (c) control over the task (0 = *none at all*, 10 = *a lot*); and their own (d) feelings during the task (0 = *not anxious*, 10 = *extremely anxious*); (e) control over how their child felt during the task (0 = *not at all*, 10 = *a lot*); and (f) control over how the child did during the task (0 = *none at all*, 10 = *a lot*).

**Maternal parenting behaviors.** Maternal behaviors were rated on scales developed by Murray et al. (2012), adapted to be suitable to children aged 7–12 years and to the specific tasks. Ratings were given for each minute of the mother-child interaction. Since interactions varied somewhat in duration, mean scores were calculated for each task. For each interaction dimension (see below), mean scores for each task were summed to give total scores across the full range of tasks. As in Murray et al. (2012), maternal behaviors were rated on 5-point scales, 1 = *none*, 5 = *pervasive/strong*, apart from promotion of avoidance (3 points). The behaviors rated were as follows:

### 1. Negative Behaviors

1.1. Expressed anxiety (i.e., modeling of anxiety). Anxiety in facial expression (e.g., fearful expression, biting lip), body movements (e.g., rigid posture, wringing hands), and speech (rapid, nervous, or inhibited).

1.2. Passivity. Withdrawn and inhibited, unresponsive to child behavior and communication (e.g., physically distant, silent).

1.3. Promotion of avoidance. Actively encourages/supports child avoidance of task (e.g., saying "you don't have to do it").

1.4. Overprotection. Initiates emotional and/or practical support that is not required (stroking/ kissing/offering unnecessary help while child manages independently).

1.5. Intrusiveness. Interferes, verbally or physically, cutting across child behavior, attempts to take over and imposes own agenda.

### 2. Positive Behaviors

2.1. Encouragement (autonomy-promotion). Provides positive motivation to child to engage in the task, showing enthusiasm regarding both task and child capacity/efforts.

2.2. Warmth. Affectionate, expresses positive regard for child, both verbally and physically.

2.3. Quality of relationship. Sense of relatedness and mutual engagement between mother and child (e.g., talking, listening, laughing, and joking with each other).

### 3. Communication of Fear-Relevant Information

3.1. Threat promotion. Increases threat associated with task by saying it will be unpleasant or scary in some way.

3.2. Vulnerability promotion. Highlights the child's actual or potential difficulties in completing the task by suggesting the child is vulnerable or incompetent (e.g., nervous/incapable).

## Children's Anxious Response to the Tasks

Following Murray et al. (2012), observed child anxiety during each of the three tasks was scored on a 5-point scale (1 = *absent*,

5 = *pervasive/strong*) on the basis of facial expression (e.g., fearful expression, biting lip), body movements (e.g., rigid posture, wringing hands, touching face), and speech quality (e.g., tense or inhibited, quiet) and content (e.g., mention of being scared) during each of the three tasks. Child avoidance was also scored (1 = *absent*, 5 = *pervasive/strong*) on the basis of the extent to which the child avoided approaching or completing the task. As for parental behaviors, ratings were given for each minute of the task, and the mean scores across the three tasks were summed.

Videotapes of mother and child behaviors were scored by graduate psychologists, blind to maternal group. For each coder, in each task, a second coder independently scored a random sample of 25 videotapes. Independent coders were assigned so that all tasks were scored by overlapping coders (though for different participants, to avoid contamination) to ensure dimensions were scored similarly across tasks. Intraclass correlations showed good agreement: maternal-expressed anxiety,  $M = .77$  (range .60–.89 across tasks/raters); passivity,  $M = .77$  (range .60–1.00); promotion of avoidance,  $M = .84$  (range .62–1.00); overprotection,  $M = .97$  (range .81–1.00); intrusiveness,  $M = .85$  (range .68–.99); encouragement,  $M = .76$  (range .62–.95); warmth,  $M = .82$  (range .69–.95); quality of relationship,  $M = .81$  (range .68–.95); threat promotion,  $M = .88$  (range .74–.99); vulnerability promotion,  $M = .88$  (range .61–1.00); child-expressed anxiety,  $M = .75$  (range .65–.92); child avoidance,  $M = .85$  (range .68–.93).

## Results

### Data Reduction and Analytic Strategy

After examining variable distributions and removing outliers, we checked whether variables could be reduced. Variables were combined where they related to theoretically similar dimensions and their intercorrelations indicated their combination. Thus, with regards to maternal pretask expectations, mothers' expectations of their control over their child's feelings and control over their child's performance correlated highly ( $r[88] = .75, p < .001$ ), and so they were combined for analyses. In relation to maternal post-task evaluations, high levels of association were found between (a) maternal evaluations of the child's performance and child's control ( $r[85] = .66, p < .001$ ), and (b) the mothers' control of child's feelings and control of the child's performance ( $r[85] = .72, p < .001$ ). These sets of variables were, therefore, also combined. All other variables correlated at  $r < .60$ .

With regard to behavioral dimensions of parenting, the two dimensions of maternal positive behaviors, warmth and encouragement, correlated highly ( $r[88] = .65, p < .001$ ), and they were, therefore, combined into a dimension of "positive behaviors." All other variables were correlated at  $r < .60$ . The correlation between child anxiety and avoidance approached this cut-off ( $\rho[88] = .55, p < .001$ ); as the variables are conceptually so similar, these were combined into a single anxiety-avoidance variable.

To address the hypotheses relating to differences according to maternal anxiety status (hypotheses 1–3), multivariate analyses of covariance (MANCOVA) were conducted, controlling for the extent of maternal depressed mood (DASS21). Maternal anxiety status and child-expressed anxiety during the task, and their interaction, were entered as independent variables, with maternal pre-task expectations, posttask evaluations, or maternal behaviors dur-

ing the task as the dependent variables. Where the MANCOVA indicated significant effects of maternal anxiety group, observed child anxiety-avoidance, or maternal depressed mood, between subjects tests were used to identify which ratings or behaviors accounted for these effects. As the distribution of scores on overprotection, promotion of avoidance, and passivity were highly skewed, reflecting a bimodal distribution, these scales were dichotomized according to presence or absence of the behaviors. For these variables, binary logistic regression analyses were conducted with maternal anxiety status, child-expressed anxiety during the task, extent of maternal depressed mood, and the maternal anxiety status  $\times$  child-expressed anxiety interaction entered as predictors. Notably, when age and gender were entered as covariates, these were rarely associated with any of the dependent variables and did not alter the effects of any other independent variables or covariates.<sup>1</sup> Analyses below are, therefore, reported without inclusion of child age or gender.

Hypothesis 4 concerned mediation of the association between maternal anxiety status and behaviors, by maternal expectations and evaluations. Where significant associations were found between each of maternal group, maternal cognitions, and behaviors, the strength of the indirect path (via maternal expectations/appraisals) was examined using bootstrapped confidence intervals (Preacher & Hayes, 2004).

### Pretask Expectations

It was hypothesized that, in comparison with nonanxious mothers, mothers with a current anxiety disorder would report more negative expectations regarding their child's and their own responses (hypothesis 1). In order to aid interpretation of the following analyses, observed child anxiety-avoidance during the task itself was compared across maternal groups, and no significant differences were found,  $t(86) = .47, p = .64$  (anxious mothers,  $M = 12.45$ ; nonanxious mothers,  $M = 12.72$ ).

For maternal expectations regarding their child's participation in the challenge tasks, there were significant effects of maternal anxiety status ( $F[5, 75] = 4.41, p = .001$ ; partial  $\eta^2 = .23$ ), child-expressed anxiety ( $F[5, 75] = 3.94, p = .003$ , partial  $\eta^2 = .21$ ), and their interaction ( $F[5, 75] = 4.23, p = .002$ , partial  $\eta^2 = .22$ ), but not of maternal depressed mood ( $F[5, 75] = 1.83, p = .12$ ; partial  $\eta^2 = .11$ ). Table 2 shows the between subjects effects for each pretask expectation measure by group. It can be seen that the overall effect of maternal anxiety status was accounted for by differences in maternal pretask ratings of child performance and maternal ratings of their own control of their child's feelings and performance. Between subjects tests also indicated that the effect of observed child anxiety was accounted for by associations with all of the mother's pretask expectation ratings, with the exception of maternal control of child feelings/performance (see Table 3). However, the significant interaction between maternal group and child-observed anxiety was specifically accounted for by maternal expectations of child performance and maternal expectations of control of child feelings/performance (see Figures 1a–1b). As shown in Figure 1a, nonanxious mothers' expectations appeared to be in line with their child's expressed anxiety during the tasks, with better ratings of expected performance associated with lower levels of child-expressed anxiety. By contrast, anxious mothers' expectation ratings were similar

whether or not their child exhibited anxiety during the task. Finally, where children expressed high anxiety in the task, this was associated with expectations of *lower* levels of control among nonanxious mothers and *higher* levels of control among anxious mothers (see Figure 1b).

### Posttask Evaluations

It was also proposed (hypothesis 2) that, compared with non-anxious mothers, mothers with a current anxiety disorder would give more negative (posttask) appraisals, particularly when children expressed high levels of anxiety during the task. For maternal posttask evaluations, there were significant effects of maternal anxiety status ( $F[4, 75] = 3.52, p = .01$ ; partial  $\eta^2 = .16$ ), child-expressed anxiety ( $F[4, 75] = 7.65, p < .001$ ; partial  $\eta^2 = .29$ ), and a significant effect of their interaction ( $F[4, 75] = 3.97, p = .006$ , partial  $\eta^2 = .18$ ). The effect of level of maternal depressed mood was not significant ( $F[4, 75] = .83, p = .51$ ; partial  $\eta^2 = .04$ ). As shown in Table 2, between subjects analyses revealed that significant group effects related to differences between anxious and nonanxious mothers on posttask ratings of mothers' negative emotions and control of child feelings/performance. As shown in Table 3, associations with child-expressed anxiety were significant for evaluations of children's negative emotions, mother's negative emotions, and child performance/control. In all cases, high levels of child-expressed anxiety were associated with more negative maternal ratings. The interaction of maternal group and child-expressed anxiety was significant for mothers' negative emotions and control of child feelings/performance (Figures 1c–1d). As shown in Figure 1c, when their child did not express anxiety during the tasks, mothers with and without anxiety disorders did not differ in their own anxiety levels during the tasks; however, when their child did express anxiety, mothers with anxiety disorder evidenced higher levels of anxiety than nonanxious mothers. As shown in Figure 1d, whereas nonanxious mothers evidenced lower levels of perceived control when their children expressed higher anxiety during the challenge tasks, the converse was true for anxious mothers: they evidenced higher levels of perceived control when their children expressed high levels of anxiety.

### Maternal Behaviors

It was also proposed (hypothesis 3) that, compared with non-anxious mothers, mothers with a current anxiety disorder would display increased fear, communicate more fear-relevant information, and promote less autonomy, particularly when children expressed high levels of anxiety during the task. For maternal behaviors during the challenge tasks, the effect of maternal anxiety status was significant ( $F[6, 76] = 2.65, p = .02$ ; partial  $\eta^2 = .17$ ), as were the effects of child-expressed anxiety ( $F[6, 76] = 4.12, p = .001$ ; partial  $\eta^2 = .25$ ) and their interaction ( $F[6, 76] = 2.71, p = .02$ , partial  $\eta^2 = .18$ ). The effect of maternal depressed mood was not significant ( $F[6, 76] = 1.64, p = .15$ ; partial  $\eta^2 = .12$ ). Between subjects tests showed that anxious and nonanxious moth-

<sup>1</sup> The exception being a significant association between child age and maternal passivity (Exp[B] = 1.03, 95% CI = 1.00–1.06,  $p = .05$ ; indicating that mothers were more passive with younger children).

Table 2  
*Maternal Anxiety Group Differences in Expectations, Appraisals, and Behaviors*

	Anxious mothers, N = 44	Nonanxious mothers, N = 44	F(p)	Partial $\eta^2$
Pretasks expectations of child response				
Pretasks child feelings	14.73 (4.48)	13.86 (5.09)	0.03 (.85)	0.00
Pretasks child performance	20.73 (3.41)	22.07 (4.28)	7.95 (.006)	.09
Pretasks child control of performance	18.61 (4.36)	20.37 (4.60)	1.59 (.21)	.02
Pretask expectations of mother response				
Pretasks mother feelings when child doing task	12.95 (3.92)	10.32 (4.58)	0.07 (.80)	.001
Pretasks: Mother control of child feelings and performance	32.73 (10.41)	34.19 (10.74)	15.51 (<.001)	.16
Posttask evaluations of child response				
Child negative emotions	13.29 (5.51)	11.78 (5.71)	1.01 (.32)	.01
Child performance and control	41.95 (7.76)	43.29 (8.80)	1.47 (.23)	.02
Posttask evaluations of mother response				
Mother control of child feelings and performance	30.02 (10.12)	31.05 (12.75)	10.87 (.001)	.12
Mother negative emotions	11.26 (6.07)	8.34 (4.62)	4.54 (.04)	.06
Parental behaviors				
Expressed anxiety	9.93 (2.05)	9.08 (2.25)	4.43 (.04)	.05
Intrusiveness	6.78 (1.92)	6.52 (1.47)	8.23 (.005)	.09
Positive behaviors	24.28 (4.00)	23.55 (3.3)	4.89 (.03)	.06
Quality of relationship	9.40 (1.57)	9.51 (1.08)	5.30 (.02)	.06
Threat promotion	4.03 (.82)	4.27 (.83)	.19 (.66)	.002
Vulnerability promotion	3.66 (.82)	3.69 (.74)	.08 (.78)	.001
Dichotomous parental variables			Exp (B), 95% CI	
Passivity % (n) high	52.3 (23)	53.5 (23)	1.73, .02–190.07	
Promotion of avoidance %(n) high	36.4 (16)	41.9 (18)	.06, .00–9.08	
Overprotection % (n) high	31.8 (14)	23.3 (10)	.12, .001–20.95	

ers differed significantly in terms of intrusiveness, maternal-expressed anxiety, positive behaviors, and quality of relationship. As shown in Table 3, the significant effect of child-expressed anxiety related only to quality of relationship. However, the interaction between maternal anxiety status and child-expressed anxiety was significant for intrusiveness, maternal-expressed anxiety, and quality of relationship (see Figures 1e–1f). The interaction effect also approached significance for positive behaviors ( $F[1, 81] =$

3.26,  $p = .08$ ; partial  $\eta^2 = .04$ ). As shown in Figure 1, when children expressed more anxiety, anxious mothers were more intrusive (Figure 1e), more anxious (Figure 1f), and the quality of the relationship declined (Figure 1f). For those variables that were highly skewed and were transformed into binary variables (passivity, promotion of avoidance, overprotection), there were no significant effects of maternal anxiety status, child-expressed anxiety, or their interaction, although the association between degree

Table 3  
*Between Subjects Effects of Child Anxiety-Avoidance on Maternal Expectations, Appraisals, and Behaviors*

	F(p)	Partial $\eta^2$
Pretask expectations of child response		
Pretasks child feelings	8.06 (.006)	.09
Pretasks child performance	9.36 (.003)	.11
Pretasks child control of performance	10.14 (.002)	.11
Pretask expectations of mother response		
Pretasks mother feelings when child doing task	4.39 (.04)	.05
Pretasks: Mother control of child feelings and performance	.45 (.51)	.006
Posttask evaluations of child response		
Child negative emotions	18.53 (<.001)	.19
Child performance and control	7.76 (.007)	.09
Posttask evaluations of mother response		
Mother control of child feelings and performance	.21 (.65)	.003
Mother negative emotions	16.13 (<.001)	.17
Parental behaviors		
Expressed anxiety	.81 (.37)	.01
Intrusiveness	2.68 (.11)	.03
Positive behaviors	.44 (.51)	.005
Quality of relationship	10.78 (.002)	.12
Threat promotion	.003 (.96)	.00
Vulnerability promotion	.09 (.77)	.001

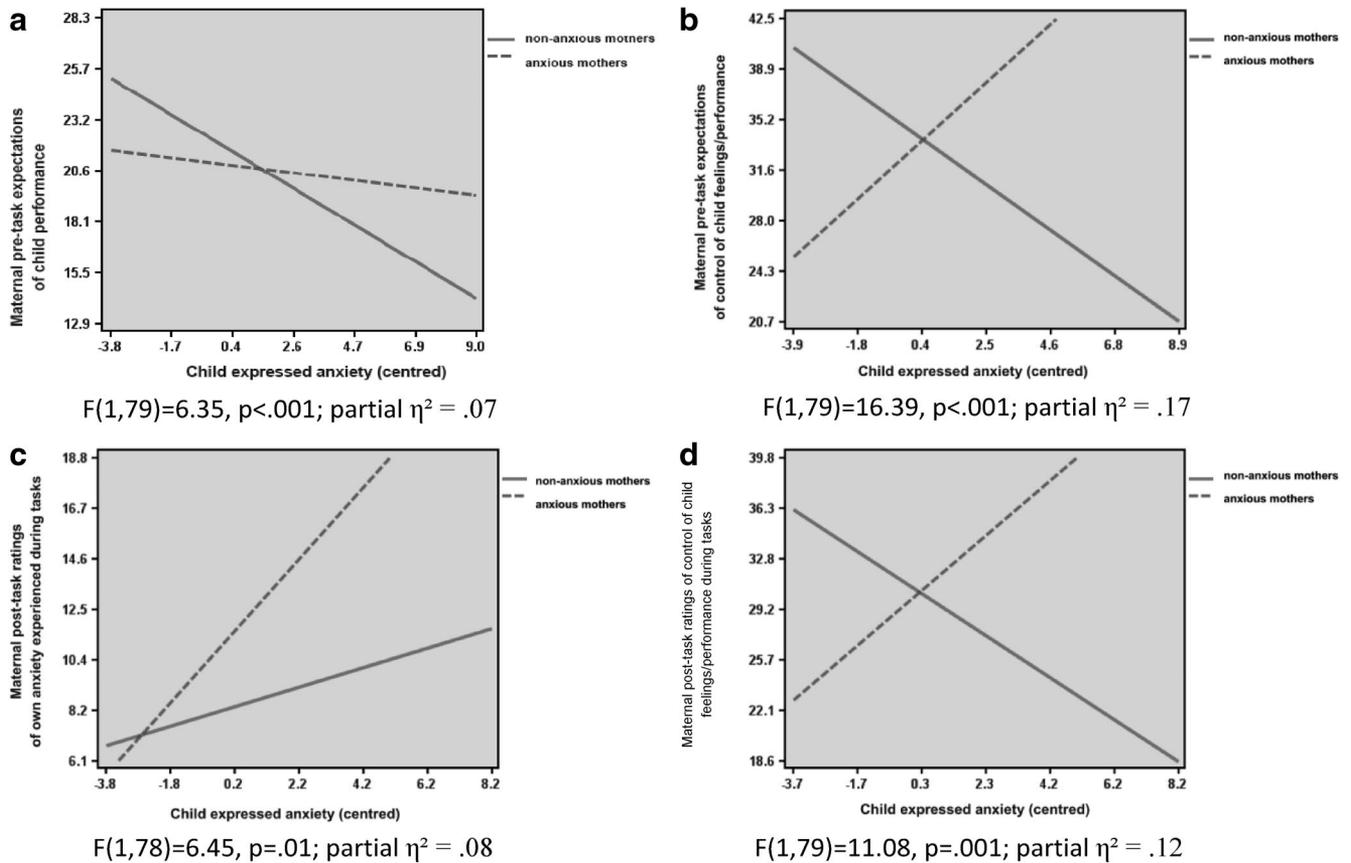


Figure 1. Interactions between maternal anxiety status and child-expressed anxiety.

of maternal depressed mood and promotion of avoidance approached significance ( $Exp [B] = .94, p = .09, 95\% CI = .87-1.01$ ); see Table 2.

**Associations Between Maternal Cognitions and Behaviors**

Finally, it was proposed (hypothesis 4) that the ratings of expectations and reported experience that distinguished anxious and nonanxious parents of anxious children would mediate group differences in parental behaviors. Correlations were first examined between those cognitive and behavioral variables that distinguished the maternal anxiety groups (i.e., pretask expectations of child performance, maternal control of child feelings/performance; posttask ratings of maternal negative emotions, control of child feelings/behavior; behavioral indices of intrusiveness, anxiety, positive behaviors, quality of relationship). As shown in Table 4, significant associations were found between (a) mothers’ pretask expectations of control of child feelings and performance and levels of maternal intrusiveness ( $r[85] = .30, p = .006$ ), and (b) mothers’ posttask reports of their actual negative emotions during the task and quality of relationship ( $r[85] = -.24, p = .03$ ). These variables were, therefore, explored as potential mediators of the associations between maternal anxiety status and maternal parenting behaviors on the basis of bootstrapped ( $n = 5000$ ) confidence intervals for estimating the indirect effects (Preacher & Hayes,

2004). For the indirect path from maternal anxiety status to behaviors via maternal pretask expectations about control of child feelings/performance, 95% confidence intervals spanned zero, and thus, they cannot be considered significant ( $M = .30, SE = .21, 95\% CI = -.12 \text{ to } .74$ , respectively). The indirect path from maternal anxiety status to quality of relationship via maternal reports of maternal actual negative emotions experienced (i.e., posttask ratings) was, however, significant ( $M = -.19, SE = .11, 95\% CI = -.45 \text{ to } -.01$ ).

**Discussion**

One of the most consistent predictors of a poor response to psychological treatments for child anxiety disorders is the presence of parental psychopathology, particularly maternal anxiety disorder (e.g., Cooper et al., 2008; Silverman, Kurtines, Pina, & Jaccard, 2009). However, the cognitive and behavioral characteristics of anxious parents of anxious children have not been clearly characterized, and they are consequently poorly understood. We examined cognitive, affective, and behavioral characteristics of anxious and nonanxious mothers of children with a current anxiety disorder, and we investigated whether maternal expectations and appraisals mediated the association between maternal anxiety status and observed parenting behaviors.

Our first hypothesis was supported in that, compared with nonanxious mothers, anxious mothers expected their children to

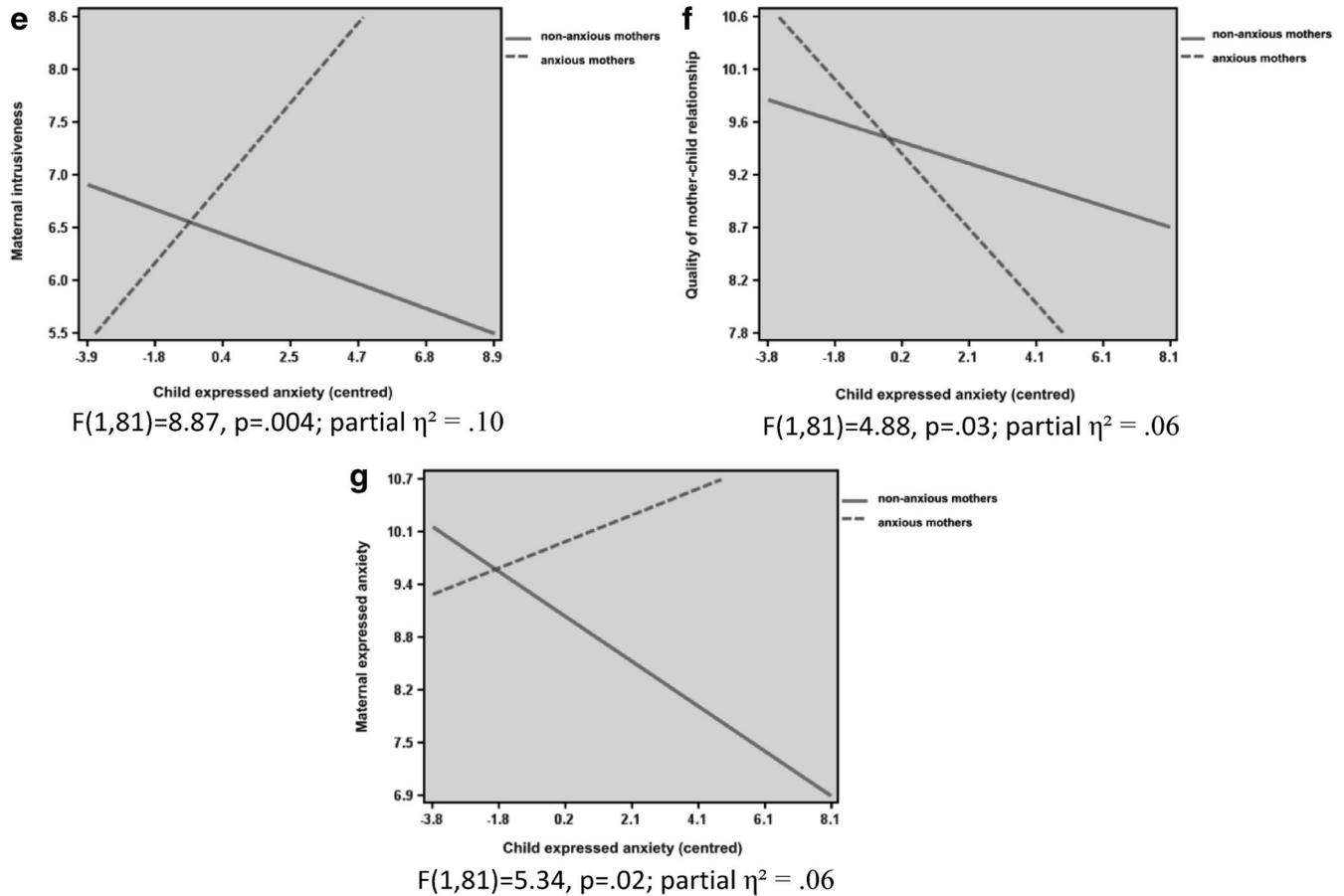


Figure 1 (continued).

perform more poorly, and they anticipated that they themselves would have less control of their child’s feelings and performance during the tasks. Notably, this effect obtained despite there being no differences in observed child anxiety and avoidance during challenge tasks for the two maternal groups. As expected, these effects were moderated by child anxiety during the challenge tasks. Specifically, nonanxious mothers’ expectations of their child’s performance varied in line with observed levels of child anxiety-avoidance, whereas anxious mothers’ predictions were stable regardless of levels of child manifest anxiety. In relation to the degree to which mothers anticipated being in control of their

child’s responses, anxious mothers who had children who went on to struggle in the task anticipated that they would have higher levels of control than those whose children did not struggle, and the reverse was found for nonanxious mothers (i.e., nonanxious mothers anticipated being more in control of children who did not go on to struggle in the task). These findings were unexpected, and they warrant further empirical examination. It remains unclear whether anxious mothers respond to child-expressed anxiety with increased perceived control as a result of their shared experience of anxiety (e.g., this is an area that they feel they have particular expertise), or whether mothers may have responded to the question

Table 4  
 Correlations (*r*) Between Maternal Cognitions and Behaviors

	Behaviors			
	Expressed anxiety	Intrusiveness	Positive behaviors	Quality of relationship
Pretask expectations				
Child performance	-.05	.009	-.10	.15
Maternal control of child feelings and performance	.12	.30**	-.10	-.15
Posttask evaluations				
Mother negative emotion	.17	.10	-.07	-.24*
Control of child feelings and behavior	.12	.15	-.07	-.11

\*  $p < .05$ . \*\*  $p < .01$ .

(about how much control they *would* have) in terms of how much they felt they *should* take control. It has certainly been established that highly anxious adults experience high levels of perceived responsibility (e.g., Salkovskis et al., 2000), and it might be anticipated that this will extend to perceived parental responsibility. This is consistent with the suggestion that anxious parents may view their child's environment in accordance with their own negative perspective of the world due to the systematic activation of hypervalent schemata, which guide cognitive processing toward negative aspects of the self and environment (Lester, Field, Oliver, & Cartwright-Hatton, 2009).

Some support was also found for our second hypothesis. Following the child challenge tasks, anxious mothers were more likely than nonanxious mothers to rate their own emotions during the task negatively, and to make lower estimations of the degree to which they had control over their child's responses. These effects were also moderated by the degree to which the child expressed anxiety during the tasks. That is, anxious mothers reported that they experienced particularly high levels of anxiety only when their child appeared to struggle in the task. In addition, and consistent with the pattern of their pretask expectations, anxious mothers reported experiencing higher levels of perceived control in the context of high, compared with low, expressed child anxiety, whereas the reverse was true for nonanxious mothers. As is discussed further below, this suggests that anxious parents may have particular difficulty tolerating their child's negative emotions, a process which is likely to promote anxiogenic parenting practices (e.g., Cheron, Ehrenreich, & Pincus, 2009; Tiwari et al., 2008).

Our third hypothesis predicted that mothers with a current anxiety disorder would differ from nonanxious mothers in the degree to which they expressed anxiety, promoted autonomy, and communicated fear-relevant information. This hypothesis was partially supported by the findings. Specifically, compared with nonanxious mothers, anxious mothers displayed higher levels of anxiety and intrusiveness, and a poorer quality of relationship; notably, however, positive maternal behaviors were higher among anxious mothers. The association between maternal anxiety and parenting was particularly strong where children manifested a high level of anxiety in the task. These moderating effects may explain the lack of consistency in previous findings relating to parental behaviors in the context of maternal anxiety (e.g., van der Bruggen et al., 2008), as they suggest that studies that are conducted in low-stress conditions will not be capable of eliciting differences in the behaviors of anxious and nonanxious mothers. This is consistent with our previous research (Murray et al., 2012). It is plausible that, if mothers respond to child expressions of fear or anxiety with fear, intrusiveness, and negativity—as the findings of the current study indicate—this will inhibit successful child exposure to fear-inducing stimuli, a key element of cognitive-behavioral treatments for childhood anxiety (e.g., Kendall, 2011). This suggests that the critical parenting variables need to be targeted directly to improve treatment outcome for child anxiety in the context of maternal anxiety disorder. Indeed, in studies where parental behaviors have been directly targeted, the level of parental anxiety has not been found to predict child treatment outcome (e.g., Wood, Piacentini, Southam-Gerow, Chu, & Sigman, 2006), a finding consistent with the suggestion that parenting behaviors may indeed be a mediating factor in the relationship between maternal anxiety and child anxiety treatment outcome.

Finally, there was support for our fourth hypothesis, in that mothers' reports of their own anxious feelings during the task significantly mediated the association between maternal anxiety status and the quality of the mother-child relationship. Specifically, compared with nonanxious mothers, anxious mothers were more inclined to find the experience of their child being in a challenging situation anxiety-provoking, and this accounted for the poorer quality of relationship with their child. It is also notable that maternal expectations regarding their control of their child's response was significantly associated with maternal intrusiveness (although this did not mediate the association between maternal anxiety disorder and these behaviors). It has been suggested that parents of anxious children display increased experiential avoidance of negative emotions; in other words, that they have a limited ability to tolerate their child's distress, and this leads to anxiogenic parental behaviors (Tiwari et al., 2008). The findings of the current study support the hypothesis that parents of anxious children who themselves have an anxiety disorder have reduced tolerance of children's negative emotions. Strategies to develop parental acceptance of negative emotions (e.g., Hayes, Strosahl, & Wilson, 2003) have shown promise as an adjunctive intervention for parents of children with disruptive behaviors (e.g., Coatsworth, Duncan, Greenberg, & Nix, 2010), and they may be a useful adjunct to treatments for child anxiety in the context of maternal anxiety disorder.

Some study limitations should be noted. In particular, the composition of the sample (mostly high SES, Caucasian families) limits the extent to which our findings can be generalized. In addition, it is not known to what extent the findings will generalize to nontreatment-seeking samples where parents may, plausibly, be particularly avoidant of encouraging their children to face their fears or, alternatively, may be more able to tolerate their children's difficulties. Future studies with community populations will be necessary to address these issues. Conclusions are also limited by the cross-sectional nature of the study, and our findings warrant scrutiny within prospective and experimental methodologies. The study also focused specifically on interactions between mothers and their children, and the lack of consideration of paternal anxiety and father-child interactions is a significant shortcoming, particularly given the suggestion that mothers and fathers may have unique influences on the maintenance of child-anxiety problems (e.g., Bögels & Phares, 2008). Extending the investigation to consider fathers is clearly an important line for future research. While we included a range of tasks, to maximize opportunities to elicit mild stress within participants, the tasks all involved the parent-child dyad completing activities. Our failure to find differences in parental communication of fear-relevant information may reflect, therefore, a reduced opportunity for discussion regarding anxiety-provoking events. Further studies could do well to consider similar questions using discussion task methods, with utterance-based coding.

In summary, the findings from the current study suggest that anxious mothers of clinically anxious children display particular cognitive, emotional, and behavioral characteristics, and that these are especially evident in conditions of elevated child anxiety. Attention to these characteristics in the treatment of childhood anxiety in the context of maternal anxiety disorder may be important in optimizing child treatment outcomes.

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