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Maternal Acceptance Moderates Fear Ratings and Avoidance Behavior in Children

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Abstract

Avoidance is a hallmark feature of anxiety disorders, and avoidance-related impairment is often key to meeting diagnostic criteria. In children and adolescents with anxiety disorders, levels of avoidance vary considerably. Using a novel motion-tracking measure of avoidance behavior, we examined whether maternal acceptance, characterized by warm and accepting responses to child feelings and behaviors, moderates the association between fear of spiders and behavioral avoidance of spider stimuli in 103 clinically anxious children. As hypothesized, maternal acceptance significantly moderated children's avoidance behavior. Child's fear of spiders was significantly associated with behavioral avoidance when mothers were low in acceptance, as rated by either mothers or children. When mothers were high in acceptance, as rated by either mothers or children, child self-rated fear of spiders was not significantly associated with child avoidance. These are the first results to empirically demonstrate the moderating role of maternal acceptance in anxious children's avoidance behavior.

Keywords

Maternal Acceptance; Fear; Avoidance; Children and Adolescents; Anxiety Disorders

Introduction

Avoidance behavior is a hallmark feature of anxiety disorders in children and adolescents (from here on referred to as children) [1, 2] and avoidance-related impairment is key to meeting diagnostic criteria. Children with separation anxiety disorder, for example, often avoid sleeping alone; children with specific phobia often avoid the object of their fear, such as high places or blood draws [2]. There is a great deal of variability in avoidance behavior across anxiety disorders [3–5]. The factors that determine varying levels of avoidance behavior in children with anxiety disorders are unknown [6]. Advancing knowledge of these factors can shed light on developmental trajectories of child anxiety disorders, and inform prevention and treatment efforts.

There is extensive documentation in the literature for the role of parenting in the development and maintenance of anxiety disorders in children [7–12]. One parenting factor consistently found to be associated with child anxiety that plausibly contributes to shaping children's avoidance is maternal acceptance. Maternal acceptance is a pattern of behavior characterized by mothers' warm and accepting responses to their child's feelings and behaviors [13]. Maternal acceptance provides an environment that allows children to feel safe and secure, including regarding negative internal experiences and reactions. By promoting this sense of safety and security, maternal acceptance is thought to enable children to better tolerate the experience of fear and thus show less avoidance of feared stimuli and situations [14].

Developmental studies support the role of positive and supportive maternal behavior in moderating the developmental trajectory of avoidance behavior in temperamentally anxious young children [15, 16]. A longitudinal study of 64 infants and their mothers demonstrated that infants who were highly reactive to novelty at six months showed more avoidance behavior at 2.5 years of age only when their mothers were low in engagement and support. When mothers were high in engagement and support, infant reactivity at six months did not predict avoidance behavior at 2.5 years of age [15].

Support for the role of maternal acceptance in moderating children's avoidance levels also comes from cross-sectional studies with clinical and non-clinical children. Specifically, with both clinical and non-clinical samples, significant negative associations have been found between ratings of maternal acceptance and child anxiety severity [17–19]. For example, Hudson and Rapee [19] found that mothers of children with clinical anxiety disorders (N=43, ages 7–15 years) were less accepting and more rejecting compared with mothers of non-clinical children (N=32). In another study, non-clinical children (N=2624, ages 10–16 years) who rated their parents high in acceptance rated themselves lower in anxiety severity compared to non-clinical children who rated their parents low in acceptance [20].

We know of only a single study that directly examined the association between maternal parenting practices and child avoidance behavior [4]. In this study 44 children (ages 7–14 years) with specific phobia of small animals, were asked to approach a phobic object. This procedure was completed twice, once in the absence of their mother and once in her presence. Children rated their fear at the start and end of each procedure. Children showed less avoidance behavior when their mother was present than when their mother was absent, and maternal warmth and involvement were negatively associated with avoidance behavior in the children.

Taken together, the longitudinal developmental studies in infancy and early childhood, and the cross-sectional studies in children, provide preliminary empirical support for the theoretical model implicating maternal acceptance in the avoidance behavior of anxious children. The current study, however, is the first to empirically test the hypothesis stemming from this model that maternal acceptance is a significant moderator of the association between fear and avoidance in childhood anxiety disorders.

We went beyond past research in this area by using a multi-informant (children, mothers) strategy to assess maternal acceptance, and a novel motion-tracking behavioral avoidance task to objectively measure children's avoidance behavior. Previous studies assessed maternal acceptance using observations of parent-child interactions in structured situations [4, 19] or through questionnaires, usually completed by the child only [17, 18, 20, 21]. If a similar pattern of results will emerge for both informants, confidence in these results will increase. We hypothesized that maternal acceptance would moderate children's avoidance levels such that children's self-rated fear of spiders and their level of behavioral avoidance of spider stimuli would be significantly associated when mothers were rated low on acceptance by either mothers or children, and that when mothers were rated high on maternal acceptance by either mothers or children, children's self-rated fear of spiders and level of behavioral avoidance would not be significantly associated.

Method

Participants

Participants were 103 children, ages 6–17 years (Mean = 11.12 years; SD = 3.30; 64% females) and their mothers, who presented for evaluation at a specialty anxiety clinic at a large medical center in the Northeastern United States. Participation in the study occurred at the evaluation, before any treatment delivery. Children met DSM-5 [2] criteria for a primary anxiety disorder diagnosis of: generalized anxiety disorder (41%), social phobia (29%), separation anxiety disorder (15%), specific phobia (9%), or panic disorder (6%). The average number of anxiety diagnoses was 2.24 (SD = 1.10), and ranged from 1 to 5. Secondary non-anxiety disorder diagnoses included attention deficit hyperactivity disorder (16%), oppositional defiant disorder (14%), major depression (10%), dysthymia (7%), post-traumatic stress disorder (5%), enuresis (3%) and conduct disorder (2%). Because we used spider stimuli to gauge avoidance behavior, we only included children who scored above 11 on a measure of spider phobia (Spider Phobia Questionnaire - Child Version (SPQ-C)) [22]. All participating children were enrolled in a regular educational setting and were fluent English speakers. English was the primary language spoken in most (98%) of the homes with the remainder speaking Spanish as the primary language. Children were predominantly non-Hispanic White (88%) with a minority being African-American (5%), Asian (4%) or "other" (3%). Annual income was below \$70,000 for 13% of households, between \$70,000 and \$99,999 for 22% of households, and above \$100,000 for 65% of households. Most mothers (73%) reported receiving secondary education.

Procedure

The study was approved by the University Institutional Review Board. Upon arrival, study procedures were explained and signed informed consents and assents were obtained from mothers and children, respectively, before any additional study procedures. Mothers and children were administered separate diagnostic interviews about the child, and completed the rating scales. Children were aided in the completion of study forms if necessary, by trained research personnel. Children were then administered the Yale Interactive Kinect Environment Software (YIKES) task. This motion tracking task (described below), took approximately 10 minutes, including instructions and a 1-minute practice.

Measures

Anxiety disorders—The presence of a primary DSM-5 anxiety disorder diagnosis was established using the Anxiety Disorders Interview Schedule - Child and Parent Versions (ADIS C/P) [23], which were administered separately to the child and to the mother. The ADIS C/P is a semi-structured diagnostic interview with good to excellent reliability for establishing diagnoses, and strong correspondence with anxiety questionnaire ratings [23, 24]. The ADIS C/P was administered by graduate level clinicians or licensed psychologists, trained in its use by one of the instrument's authors. Training included observing live and videotaped samples, supervised administration, and discussion of discrepancies in diagnoses. As in past research, in cases of discordance between parent and child reports the clinician considered both informants' views to derive a final diagnosis [25, 26].

Spider phobia—Child fear of spiders was rated using the Spider Phobia Questionnaire - Child Version (SPQ-C) [22]. The SPQ-C includes 29 statements to which participants respond either yes or no. For example, "Even a toy spider in my hand scares me a bit" and "Thinking of spiders makes me shiver". Scores are calculated as the sum of items to which the child indicated a positive response (after reverse coding certain items) and can range from 0 to 29. The internal consistency, reliability, and construct validity of the SPQ-C have been well established [22, 27, 28]. Internal consistency in the current sample was adequate ($\alpha = .68$).

Maternal acceptance—Maternal acceptance was rated using the Child/Parent Rated Parent Behavior Inventory (C/PRPBI-30) [29]. Children and mothers were administered the acceptance/rejection scale of this questionnaire which has been used in other recent studies [7, 30]. The 10-item acceptance/rejection scale describes warmth, nurturance, and expression of affection. For example, "My mother makes me feel better after talking over my worries with her" (child version) and, "I am able to make my child feel better when he/she is upset" (mother version). Children and mothers rated the items on a 3-point Likert scale reflecting the extent to which these statements represent the mother: 0 = "not like", 1 = "somewhat like" and 2 = "a lot like". The child/parent acceptance/rejection scale from the CRPBI, has been widely used as a valid and reliable measure of acceptance in past research [18, 31–34]. Internal consistency in the current sample was excellent for children ($\alpha = .87$) and adequate for mothers ($\alpha = .75$).

Behavioral Avoidance—Child behavioral avoidance of spider stimuli was measured using YIKES, a system for accurately capturing participant location, using motion-tracking, during a game that requires approach to phobic stimuli. Participants stood in front of a 55" liquid crystal display (LCD) and their image was projected onto the screen, overlaid on a game environment. The game required participants to walk to the right and to the left to catch balls that appeared to fall from the top of the screen. Throughout the game spider images and neutral images were displayed on alternating sides of the screen, such that at any given moment a participant was either moving toward a spider image and away from a neutral image, or vice versa. See Figure 1 for an illustration of the YIKES task. Following earlier research [35], participants' motion in the direction of the spider images and in the direction of the neutral images were compared to derive an index of avoidance behavior.

Avoidance of the spider images was operationalized as turning back away sooner (and thus maintaining a greater distance) when moving toward spider images compared to when moving toward neutral images [35]. This task has been used repeatedly in studies of avoidance behavior and has shown good convergent and divergent validity [35–37].

Data Analytic Plan

All analyses were conducted in SPSS (version 24). We used bivariate Pearson r correlations to examine the association between child self-rated fear of spiders, mother and child-rated maternal acceptance, and child behavioral avoidance of the spider images. To test the hypothesis that maternal acceptance, rated by either mother or child, moderates the association between fear of spiders and avoidance of spider stimuli, we first conducted hierarchical multiple linear regressions, with avoidance as the predicted variable. We repeated this analysis for mother-rated maternal acceptance and separately for child-rated maternal acceptance. In the first step, we included fear of spiders and maternal acceptance. In the second step, we added the interaction term equal to the product of fear of spiders and maternal acceptance. Significant change in explained variance in avoidance of the spiders when the interaction term is included in the analysis provides evidence of moderation. We then used the PROCESS macro for SPSS [38] to calculate simple slopes for the associations between children's fear of spiders and avoidance of spider images for low (1 SD below the mean), moderate (mean), and high (1 SD above the mean) levels of maternal acceptance, and calculated 95% confidence intervals for the effect sizes based on bootstrapping procedures with 5000 samples.

Results

Preliminary Analysis

Spider phobia scores (SPQ-C) ranged from 11 to 25 with an average SPQ-C score of 16.17 ($SD = 3.94$). Males and females did not differ significantly on any of the study variables. Child age was negatively associated with child-rated maternal acceptance ($r = -.31$, $p = .01$), but was not significantly correlated with any other study variables. Child age did not interact with spider phobia, with child-rated maternal acceptance, or with mother-rated maternal acceptance to predict child avoidance. The presence or absence of any particular anxiety disorder (i.e., generalized anxiety, social phobia, separation anxiety, panic disorder, specific phobia) or secondary non-anxiety disorder was not significantly associated with behavioral avoidance or maternal acceptance.

There were no missing data. Non-model based and model based outlier analyses were undertaken prior to all major analyses. For the former, multivariate outliers are identified by examining leverage indices for each individual and defining an outlier as a leverage score four times greater than the mean leverage. For model-based outlier analyses, we selected all predictors in the model and regressed them on YIKES scores. An outlier was defined as any case with an absolute standardized $dfbeta$ larger than 1.0. No outliers were identified using either of these analyses.

Bivariate Correlations

As expected, child self-rated fear of spiders was significantly positively associated with behavioral avoidance of the spider images ($r_{103} = .30, p < .01$). Children who scored higher on the SPQ-C turned back away sooner when moving toward spider images compared to when moving toward neutral images. Mother-rated maternal acceptance was significantly positively associated with child-rated maternal acceptance ($r_{103} = .39, p < .01$). Maternal acceptance as rated by both mothers and children was not significantly associated with avoidance of the spider images as measured by YIKES, or with fear of spiders as measured with SPQ-C. Table 1 summarizes means, standard deviations, and bivariate correlations for the study variables.

Moderation Analysis

Results of the hierarchical multiple regressions with fear of spiders and maternal acceptance as the independent variables and with children's avoidance of spider stimuli as the dependent variable, showed significant change in explained variance when the interaction term between fear of spiders and maternal acceptance was included in the analyses, providing evidence of moderation. This was the case when the analyses were performed using children's ratings of maternal acceptance as well as when the analyses were performed using mother's ratings of maternal acceptance. The first step, including fear of spiders and maternal acceptance, resulted in explained variance of $R^2 = .41$ (adjusted $R^2 = .17$) for mother-rated maternal acceptance, which was significantly different from zero ($F = 6.01, p < .001$), and of $R^2 = .49$ (adjusted $R^2 = .24$) for child-rated maternal acceptance, which was also significantly different from zero ($F = 7.013, p < .001$). In the model examining child-rated maternal acceptance we controlled for age, because of the significant bivariate correlation between child-rated maternal acceptance and child age.

The second step, with the addition of the interaction term equal to the product of fear of spiders and maternal acceptance, increased the explained variance by 4.24% for mother-rated maternal acceptance, which was significantly different from step 1 ($F_{\text{change}} = 4.58, p = .035$), and by 7.70%, for child-rated maternal acceptance, which was also significantly different from step 1 ($F_{\text{change}} = 8.97, p = .004$).

We next examined the slopes of the associations between fear of spiders and behavioral avoidance of the spider stimuli at different levels of maternal acceptance. The analysis was repeated for mother-rated maternal acceptance and child-rated maternal acceptance. We found that the effect size became smaller as maternal acceptance increased, such that when maternal acceptance was high, the association between fear of spiders and behavioral avoidance of the spider stimuli was not significant ($\beta = .39, 95\% \text{ CI} = -.45 \text{ to } 1.24, p = .36$ for mother-rated maternal acceptance, and $\beta = .20, 95\% \text{ CI} = -.65 \text{ to } 1.06, p = .64$ for child-rated maternal acceptance). In children whose mothers were rated moderate in maternal acceptance, the association between fear of spiders and behavioral avoidance was significant ($\beta = 1.06, 95\% \text{ CI} = .49 \text{ to } 1.64, p < .001$ for mother-rated maternal acceptance, and $\beta = 1.21, 95\% \text{ CI} = .64 \text{ to } 1.77, p < .001$ for child-rated maternal acceptance), and in children whose mothers were rated low in maternal acceptance, the association between fear of spiders and behavioral avoidance was the strongest ($\beta = 1.73, 95\% \text{ CI} = .88 \text{ to } 1.56, p < .0001$ for mother-

rated maternal acceptance, and $\beta = 2.21$, 95% CI: 1.31 to 3.11, $p < .001$ for child-rated maternal acceptance). Figures 2(A) and 2(B) plot the simple slopes for the interactions and illustrate that fear of spiders was not associated with behavioral avoidance in children whose mothers were rated high in maternal acceptance. This was the case for mother-rated maternal acceptance (Figure 2(A)), as well as for child-rated maternal acceptance (Figure 2(B)).

Discussion

This is the first study to demonstrate the role of maternal acceptance in moderating the association between fear ratings and avoidance behavior in anxious children. Child self-rated fear of spiders was significantly associated with behavioral avoidance of spider images in clinically anxious children when mothers were rated low or moderate on acceptance by either the mothers or the children. In contrast, when mothers were rated high on maternal acceptance, by either the mothers or the children, child self-rated fear of spiders was not significantly associated with behavioral avoidance of spider images in the anxious children. These results are in line with the theoretical model positing that warm and accepting responses to a child's negative internal experiences, on the part of the mother, reduce the behavioral impact of those experiences leading to less avoidance behavior [14]. The results are also in line with developmental research showing that the link between fearful reactions in infants and avoidance behavior in early childhood is moderated by maternal behavior [15]. Previous studies have reported on associations between maternal acceptance and childhood anxiety and avoidance, but did not directly examine the moderation hypothesis in childhood [4, 12, 17, 19, 20].

Results of this study contribute to the understanding of individual differences in avoidance behavior. One implication of these findings is that a child with temperamentally high levels of fear whose mother is less accepting may show more behavioral avoidance. This may have several concurrent and consequential impacts including placing children at increased risk for the development of an anxiety disorder. The earlier longitudinal research in infants and young children, showing the moderating role of parenting practices on the risk for anxious behavior in infants with high levels of fear and negative emotionality [15], further support this notion.

The current findings also have potentially important implications for treatment of child anxiety. Reducing avoidance behavior is a major target of cognitive-behavioral therapy (CBT), the front-line evidence based psychosocial treatment for child anxiety [1, 39]. Despite its well-established efficacy, approximately 40–50% of anxious children do not benefit sufficiently from CBT [40, 41]. One of the challenges to successful CBT is the reluctance of some children to engage in behavioral exposures to the feared stimuli [42]. The current results underscore the importance of considering maternal acceptance during child anxiety assessment and case formulation, and point to the intriguing possibility that increasing acceptance through parent-based interventions could increase the feasibility and success of CBT for anxious children.

Strengths of this study are the multi-informant approach to assessing maternal acceptance, and the use of an innovative measure of child avoidance behavior. The multi-informant

approach to assessing maternal acceptance, showing similar results from both children and mothers, reduce the risk of bias and increase confidence in the results. Using the motion-tracking system YIKES, we were able to obtain an objective indicator of child behavioral avoidance. Measuring the behavior directly in this manner allows for less subjective data compared to the use of rating scales, and the disentanglement of behavioral avoidance from other aspects of anxiety such as anxious feelings or cognitions [12].

The current results need to be interpreted in light of certain limitations. First, the sample was relatively homogeneous in terms of race, ethnicity, and socio-economic status. Further research is necessary to establish whether the pattern of results reported here are generalizable to other more diverse samples. Additionally, our study focused on clinically anxious children. Additional research, including with healthy non-anxious samples, is needed to replicate the current findings and examine whether the moderating role of maternal acceptance for fearful avoidance holds across clinical and non-clinical populations. Likewise, in this first study we focused on maternal acceptance and on mothers only, as mothers have been the focus of most previous research on parental acceptance in general and in particular as to how it relates to childhood anxiety [8, 12]. Studies have shown associations between paternal acceptance and child anxiety [7, 18, 20], pointing to the possibility that paternal acceptance could also moderate child fear ratings and behavioral avoidance. This study focused on maternal acceptance, yet there are other parental variables (e.g., parental control) that should also be examined in future research. Another possible limitation of this study is the exclusive use of spider images to investigate fear and avoidance behavior. We chose to focus on spider stimuli because of the high prevalence of fear of spiders, because spider stimuli have been most widely used to study avoidance, and because avoidance of spider stimuli has been shown to be significantly and strongly associated with global measures of anxiety [35, 36, 43–45]. We are currently conducting research in our lab to examine the role of maternal acceptance using a broader set of stimuli. Finally, as mentioned, a strength of this study was our multi-informant approach to assessing maternal acceptance, based on ratings of maternal acceptance from both mothers and children. Inclusion of additional informants however, or of observational measures of maternal acceptance would have made for an even stronger design. These limitations notwithstanding, the current study presents novel and important evidence for the moderating role of maternal acceptance in avoidance behavior of children with anxiety disorders.

Summary

This study examined the role of maternal acceptance in child avoidance behavior among clinically anxious children. In children and adolescents with anxiety disorders, levels of avoidance behavior vary considerably, but the factors that determine individual levels of avoidance are unknown. We tested the hypothesis that maternal acceptance moderates the association between child's fear ratings and avoidance behavior. Using a multi-informant approach to assessing maternal acceptance and a novel motion-tracking measure of avoidance, we found that child self-rated fear of spiders was significantly associated with child avoidance of spider stimuli when mothers were rated low on acceptance by either mothers or children. When mothers were rated high on maternal acceptance by either mothers or children, avoidance was not significantly associated with child self-rated fear of

spiders. These results provide novel empirical evidence for the role of maternal acceptance in anxious children's avoidance behavior. They are the first to demonstrate the potential of maternal behaviors, specifically maternal acceptance, to mitigate the impairing behavioral impacts of child anxiety. The results have implications for exposure-based anxiety treatments and for the potential importance of incorporating parents in treating child anxiety.

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Figure 1. Illustrates a participant engaging in the YIKES behavioral avoidance task (A); and what the participant sees on the screen (B).

Figure 2. Separate regression slopes for the relation between child self-rated fear of spiders and child avoidance of spider stimuli, at low, moderate, and high, levels of mother-rated (A) and child-rated (B) maternal acceptance.

Table 1
Means, Standard Deviations and Pearson Bivariate Correlations for Study Variables

Variables	M	SD	1	2	3	4	5
1. Child Age	11.12	3.30	1.00				
2. Fear of Spiders	16.17	3.94	-.08	1.00			
3. Maternal Acceptance - Child Rated	14.96	4.83	-.30**	-.26	1.00		
4. Maternal Acceptance - Mother Rated	14.61	2.84	-.17	.11	.39**	1.00	
5. Child Avoidance Behavior	3.78	12.14	.12	.30**	.04	.04	1.00

Note.

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p < .01