The Impact of Mothers’ Trait Anxiety on their Expectations of Approach-Avoidance Behaviour in Anxious and Non-Anxious Children

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Abstract

This study investigated estimates of approach and avoidance behaviour in clinically anxious and non-anxious children and whether mothers’ expectations of their children’s avoidance differed as a function of high trait anxiety (HTA) versus low trait anxiety (LTA). Participants were 62 clinically anxious and 60 non-anxious children aged 7-12 years and their mothers. Estimates of avoidance were obtained using an analogue task in which children and mothers were given threat and pleasant information about two novel animals and were asked to estimate children’s avoidance of the threat animal’s habitat when the threat animal was present (threat condition) and absent (safe condition) from the habitat and when its presence was uncertain (ambiguous condition). Contrary to expectation, anxious children did not differ from controls in estimates of avoidance in any condition. However, relative to HTA mothers of anxious children and LTA mothers of non-anxious children, HTA mothers estimated greater approach behaviour by their non-anxious children in the threat condition. Findings suggest that mothers’ expectations of children’s approach-avoidance behaviour is influenced by both maternal and child factors.
Introduction

Anxiety disorders are among the most common psychiatric disorders in childhood, affecting approximately 25 percent of youth at some time during childhood and adolescence (Costello, Egger, & Angold, 2005). Anxiety disorders pose a significant burden on society in terms of socio-economic costs including unemployment, days lost from work, hospitalisation and medication (Waghorn, Chant, White, & Whiteford, 2005) and are associated with dysfunction in all domains of daily life exceeding that of many physical disabilities (Bodden, Dirksen, & Bögels, 2008; Buist-Bouwman et al., 2006; Greenberg et al., 1999). Childhood anxiety can seriously undermine a child’s quality of life causing impairment in academic and social functioning (Kendall, Aschenbrand, & Hudson, 2003) and if untreated presents a risk for anxiety in adolescence (Bittner et al., 2007) and adulthood (Pine, Cohen, Gurley, Brook, & Ma, 1998), in addition to other disorders (Rabian & Silverman, 2000). Therefore, it is important to improve the current understanding of factors that contribute to the development and maintenance of anxiety disorders in children in order to improve prevention, early intervention and treatments.

Parents are a salient influence on all areas of children’s development, particularly in relation to learning coping strategies in response to uncertain and threatening situations. Effective parental practices that model and promote adaptive coping strategies, such as encouraging the child’s independence and encouraging them to face difficult situations can inoculate a child against the development of an anxiety disorder (Hudson & Rapee, 2004). Conversely, parental practices that teach children that the world is dangerous and promote avoidance of stressful situations increase the likelihood of anxiety problems (Hudson & Rapee, 2004). Moreover, cognitive models of anxiety emphasise the role of threat-based appraisals of a variety of situations and stimuli in the development and maintenance of anxiety (e.g., Beck, Emery, & Greenberg, 1985).
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Numerous experimental studies with adults demonstrate an association between threat interpretation biases and anxiety (see Mathews & MacLeod, 2005, for review). Therefore, higher levels of parental anxiety are likely to influence the expectations that parents form about their children’s capacity to approach and engage with, or avoid and withdraw from, a variety of situations. The formation of such threat-based expectations could in turn influence parental practices that contribute to the development and/or maintenance of child anxiety, such as the provision of verbal information that overestimates risk and danger in situations, underestimates children’s coping, or promotes behavioural avoidance and withdrawal.

To date, however, very little research has been conducted on parental expectations of children’s approach-avoidance behaviour and the impact of parental anxiety on the formation of these biases. Similarly, little is known about the effect of anxiety upon children’s own estimates of their ability to approach or avoid a variety of situations. Previous studies have typically assessed children’s broad appraisals of their coping ability in response to ambiguous vignettes, which have revealed poorer coping estimates in anxious compared to non-anxious children (Bögels & Zigterman, 2000; Micco & Ehrenreich, 2008; Waters, Craske, Bergman, & Treanor, 2008; Waters, Wharton, Zimmer-Gembeck, & Craske, 2008). However, other studies involving explicit threat tasks such as giving an impromptu speech, have found that anxious children’s expectations of their performance did not differ from those of control children (Cobham, Dadds, & Spence, 1999).

However, mothers of anxious relative to non-anxious children make more threat interpretations and predict more avoidance behaviour from their anxious children during these performances (Cobham et al., 1999) and in response to ambiguous vignettes (Micco & Ehrenreich, 2008). Moreover, high anxious mothers of anxious children expect that their children will be more anxious and more likely to choose an avoidant solution for managing in performance situations compared to low anxious mothers of anxious children (Cobham et al.,
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1999). In other work, Creswell, O'Connor, and Brewin (2006) found that mothers’ expectations about how distressed their child would be in ambiguous situations predicted an increase in children’s threat interpretations of these situations over time. However, estimates of children’s behavioural approach versus avoidance in these situations were not explicitly assessed.

Together, these studies suggest that anxious children might differ in avoidance behaviour from non-anxious controls in ambiguous or uncertain situations but not during situations that are more explicitly threatening. However, mothers of anxious children, particularly if they are anxious themselves, may be more likely than less anxious mothers and those of non-anxious children to expect greater avoidance from their anxious children, highlighting the bidirectional influences of parent and child factors in children’s anxiety (Hudson & Rapee, 2002). However, previous studies have not assessed children’s and mothers’ expectations of approach-avoidance behaviour across a variety of situations including safe, ambiguous and threatening situations. If mothers of anxious children, particularly those who are anxious themselves, expect greater avoidance from their anxious children across ambiguous and threatening situations compared to less anxious mothers and those of non-anxious children, then this might help to identify one mechanism by which parents might contribute to the generalisation of anxiety across situations and stimuli in their children.

Current study

Therefore, in the current study we aimed to determine whether: (a) in comparison with mothers of non-anxious children, mothers of anxious children expected greater behavioural avoidance by their anxious child across safe, ambiguous and threat situations; (b) mothers’ own anxiety levels influenced the degree of avoidance that mothers’ expected of anxious
versus non-anxious children; and (c) anxious children themselves were more avoidant in comparison with non-anxious controls by virtue of the information mothers told them.

We hypothesised that high trait anxious mothers (HTA) of anxious children would estimate greater avoidance by their anxious children of a threatening animal’s habitat (threat condition) and when it was uncertain whether the threat animal was present or absent in the habitat (ambiguous condition), relative to low trait anxious (LTA) mothers of anxious children and secondarily in comparison to HTA mothers of control children (e.g., Cobham et al., 1999). We also expected that anxious children of HTA mothers would be more fearful and avoidant of the threat animal’s habitat in the ambiguous condition (e.g., Bögels & Zigterman, 2000; Creswell et al., 2006; Waters, Craske, et al., 2008; Waters, Wharton, et al., 2008) but not the threat condition (e.g., Cobham et al., 1999), relative to anxious children of LTA mothers and control children.

2. Method

2.1. Participants

A sample of 122 child-mother dyads (56 boys; 66 girls) in which children were aged 7-12 years completed the study. This included 62 dyads involving a clinically anxious child and their mother and 60 non-anxious control children and their mothers. Anxious children were recruited from parent referrals to an anxiety treatment program at a university-based clinic. Control children were recruited from local primary schools. The total number of mothers who completed the task was 121, as two children in the control group were from the same family. There were no group differences in age and gender, ps > .05. The majority of children were born in Australia and were living with both parents. The majority of anxious children (60%) and almost half of the control children (44.1%) were at the pre-pubertal stage of development according to the Tanner Pubertal Development Scale (Tanner, 1962).

2.2. Measures
The Anxiety Disorders Interview Schedule for Children, Version IV (ADIS-C/P-IV; Silverman & Albano, 1996). The ADIS-C/P-IV was used to determine the diagnostic status of all children based on parent report of children’s anxiety, mood and externalising problems. The ADIS-C/P-IV permits differential diagnoses of anxiety disorders and excludes alternative diagnoses for youth aged 7 to 17 years (Rapee, Barrett, Dadds, & Evans, 1994; Silverman, Saavedra, & Pina, 2001). The principal diagnoses of anxious children included specific phobia (n = 22), generalised anxiety disorder (GAD) (n = 17), social phobia (n = 14), separation anxiety (n = 7) and obsessive-compulsive disorder (n = 1). All anxious children subsequently completed cognitive behavioural treatment for anxiety disorders. No control children met criteria for any psychiatric disorder.

The Spence Child Anxiety Scale (SCAS-C:Spence, 1998). Anxiety severity for all children was assessed using the SCAS-C, a 45 item child self-report measure, which yields total and subscale scores according to DSM-IV anxiety diagnoses. The SCAS-C has demonstrated sound psychometric properties (Spence, 1998).

The Center for Epidemiological Studies Depression Scale for Children (CES-DC: Weissman, Orvaschel, & Padian, 1980). The CES-DC is a 20 item self-report depression inventory with good, which was used to measure depressive symptomology. Participants rated symptoms on a 4-point scale ranging from (0) rarely to (3) all of the time. The CES-DC has demonstrated high levels of convergent and construct validity, reliability and internal consistency (Weissman et al., 1980).

The Spielberger-State Trait Anxiety Inventory Form Y (STAI-Y: Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). Maternal anxiety was assessed using the trait scale of the STAI, which assesses how respondents ‘generally’ feel as a stable dispositional response to stressful situations with varying amounts of state anxiety. The STAI-T has
demonstrated adequate psychometric properties (Spielberger et al., 1983). Mothers were divided into high trait anxiety (HTA: \( n = 66 \)) and low trait anxiety (LTA: \( n = 55 \)) groups using a median split on STAI-T total scores.

*The Beck Depression Inventory* (BDI-II: Beck, Steer, & Brown, 1996). Given the high comorbidity of anxiety disorders with mood disorders (Craske & Waters, 2005), maternal depressive symptoms were assessed using the BDI-II and controlled for in the data analyses. The BDI-II is a 21 item measure of anxiety depressive severity with each item rated on a 4-point Likert scale ranging from (0) absence of symptom, to (3) severe symptom. The BDI-II possesses excellent test-retest reliability and high internal consistency (Beck et al., 1996).

*Nature reserve task.* The nature reserve task was used to assess expectancies of children’s avoidance by children and mothers. The methodology of the nature reserve task was adapted from a previous study by Field and Storksen-Coulson (2007) who modelled this innovative paradigm on a family systems therapy approach to understanding closeness in family relationships (e.g., Gehring & Marti, 2000). Using this task, Field and Storksen-Coulson (2007) examined the association between the verbal information pathway, fear cognitions and behavioural avoidance in children aged between 6 and 8 years. They found that threat information about a novel animals increased children’s self-reported fear beliefs about the animals leading to avoidance behaviour.

*Animals.* The study by Field and Storksen-Coulson (2007) was conducted in the United Kingdom, using pictures of two novel animals (i.e., Australian marsupials). In the present study, pictures of two Asian animals, the Paguma and the Binturong, were selected based on the premise that Australian participants would have no prior knowledge or fear expectations about these animals.
Verbal information. The threat and positive statements in the current study were developed by Field and Lawson (2003), and were found to successfully change children’s fear beliefs, avoidance of and attention towards animals in a number of prospective studies (e.g., Field, 2006; Field & Storksen-Coulson, 2007).

In the present study, a pilot study was undertaken to obtain ratings of the 12 animal statements to ensure that one set of statements was threatening and the other non-threatening. A convenience sample of 35 adult participants (6 males, 29 females: $M = 34.97$ years) was asked to rate each statement on a 5 point Likert scale indicating how positive or negative it was, ranging from (1) Not at all positive/negative, to (5) Extremely positive/negative. For purposes of comparison analyses to determine whether there were group differences in the statements mothers give to their children, animal statements were then ranked according to valence ratings, from (1) Least positive/negative to (6) Most positive/negative statement. The animal statements with valence ratings means and standard deviations and rankings are displayed in the Appendix. As shown, negative statements were rated as moderately negative overall, and positive statements as moderately positive to very positive.

Nature reserve paradigm. A replica of a nature reserve was constructed using a rectangular 45cm x 60cm wooden board covered in green felt material (to give the impression of grass) (see Figure 1). On each side of the board there was a 60cm long fence made out of nails and string. At the top and bottom end of the board there were two small wooden boxes (9.5 cm x 6 cm) which represented shelters for each animal. At the entrance of each animal’s shelter was a small photograph of the animal. Behind each shelter was a length of cardboard (45cm x 10cm) decorated with pictures of forest trees to give the impression that the animals lived at the edge of a nature reserve that backs onto a forest. Lego figures were used to represent the child and each member of the child’s family.
Children’s fear measures. Children’s animal fear ratings were obtained using a 10 point Likert scale ranging from (0) no fear, to (10) extreme fear, with higher scores indicating greater levels of fear.

![Figure 1](image.png)  
*Figure 1. A replica of a nature reserve used to assess avoidance of an animal about which children and mothers were given threatening or non-threatening information.*

2.3. Procedure

*Step 1.* Mothers completed the nature reserve task first with the first author in a research room, while the child waited outside. In the room, there were three identical nature reserve boards and mothers were told that each board represented a nature reserve that was home for two animals from Asia, which lived at either end of the reserve. The three boards represented *safe, threat, ambiguous conditions.* In the *safe* condition, a photograph of the safe animal only was visible at the entrance of its habitat, and participants were told that the threat animal was nowhere in the reserve. In the *threat* condition, a photograph of the threat animal only was visible at the entrance to its habitat, and participants were told that the safe animal was nowhere in the reserve. In the *ambiguous* condition, photographs of both animals were removed from the entrance of their respective shelters. Participants were told that as neither the safe nor threat animal was visible, we were uncertain as to the whereabouts of the animals and that they could be (i) inside their shelter; (ii) somewhere in the reserve; or
(iii) somewhere in the forest. The safe condition was included as a control condition to provide a baseline measure of threat avoidance.

Mothers were shown a photograph of each animal and were read the 12 animal statements (i.e., six threatening facts about one animal and six positive facts about the other animal). Information about the animals was presented in counterbalanced order across participants. Mothers were given Lego figures that represented each member of their family including themselves and were asked to place a Lego figure anywhere in the reserve that indicated where they thought each family member would stand in each condition. The distance from the threat animal’s habitat to where the Lego figures were placed was taken as a measure of avoidance in each condition.

Step 2. After completing the task, the mother was asked to select three of the six animal statements that she had been given by the first author that she would then tell her child. This was intended to measure whether mothers’ own interpretation biases influenced the information they chose for their children.

Step 3. The child was taken into the research room by the first author, while the mother waited outside. Prior to the commencement of the task, children completed a behavioural task to obtain a baseline index of fear and avoidance of a commonly feared animal (i.e., a spider). The stimuli included a plastic spider, a Lego block representing a book and a 45cm x 60cm rectangular piece of cardboard representing a classroom. The classroom was the same size and dimensions as the nature reserve task panels. The author read the following vignette and instructions to the child.

I want you to imagine that the piece of cardboard represents your classroom, and that the sides of the cardboard represent the classroom walls. Imagine that your teacher comes up to you at lunch time when you and all the other children are playing and asks
you to return a special book to the classroom. The teacher tells you that you can leave
the book anywhere in the classroom. When you enter your classroom, you see a large
spider on one of the classroom walls. Place the book anywhere in the classroom.

The distance in centimetres between the Lego block and the plastic spider was taken as
an index of avoidance of a commonly feared animal. Children were also asked how fearful
they were of spiders.

Step 4. The child then completed the nature reserve task with the first author while
their mother was present. The author introduced the child to the nature reserve task by
providing him/her with the same description that mothers received. The child’s mother then
read to the child the three statements about each animal that she has chosen earlier. Children
were instructed by the first author to indicate where in the reserve they would like to be in
each condition (i.e., safe, threat, ambiguous) by placing a Lego figure on each of the three
nature reserve boards. Children rated how fearful they felt in each condition.

2.4. Response Definitions and Analyses

Avoidance measures for mothers and children in the nature reserve task. Avoidance
data was obtained by measuring the distance between the Lego figure and the target animal’s
habitat. As the nature reserve board was 60 cm in length, the range of avoidance scores was 0
– 60. Higher scores indicated greater distance from the threat animal’s habitat and therefore
greater avoidance.

Repeated measures analyses of variance (ANOVAs) were employed to test
hypotheses. The dependent variables were: (1) children’s estimated distance from the threat
animal’s habitat; (2) child’s fear estimates; (3) mothers’ estimate of children’s distance from
the threat animal’s habitat. The within subjects variable was condition (safe, threat,
ambiguous), and the between subjects variables were: child group (anxious: control) and
maternal trait anxiety (LTA, low trait anxiety: HTA, high trait anxiety). The threat
information that children received varied slightly as mothers selected any 3 statements from the original 6 statements to tell their children. Therefore, an additional between subjects variable of negative statements threat level (higher threat: lower threat) was used in supplementary analyses to examine differences in the child data based on the level of threat of the negative statements chosen by mothers. Higher and lower levels of negative threat statements were calculated using a using a median split of mothers’ negative statements total score.

For analyses that involved multiple comparisons, Bonferroni corrections were used. Partial eta squared ($\eta^2$) was calculated as measure of effect size. When there were violations in the analyses, the Huynh-Felt correction was reported.

3. Results

3.1. Participant characteristics

The means and standard deviations for the SCAS-C, CES-DC, STAI-T and BDI-II are presented in Table 1. As expected, anxious children reported significantly higher levels of anxiety compared to control children. There was no significant group difference in children’s depression scores, with anxious and control children reporting overall mean CES-DC scores below the recommended clinical cut-off of 15 (Weissman et al., 1980). Mothers in the anxious group reported significantly higher trait anxiety and depressive symptoms compared to mothers in the control group.

A 2 group (ANX: CON) x 2 maternal trait anxiety (HTA vs LTA) ANOVA was conducted to examine whether mothers differed in negative statement total scores. The analysis revealed no significant main or interaction effects (all Fs < 3.82). However, there was a trend for mothers of anxious children to differ in their selection of threat statements ($p$
The means in Table 1 indicate that HTA mothers of control children tended to select less threatening statements than other mothers.

Table 1

Mean Scores for Parent and Child Symptom Measures and Mothers’ Negative Statements

<table>
<thead>
<tr>
<th>Measure</th>
<th>Anxious group</th>
<th>Non-anxious group</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M (SD)</td>
<td>N</td>
</tr>
<tr>
<td>Child measures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCAS-C</td>
<td>62</td>
<td>44.23 (18.40)</td>
<td>60</td>
</tr>
<tr>
<td>CES-DC</td>
<td>53</td>
<td>14.40 (8.39)</td>
<td>60</td>
</tr>
<tr>
<td>Parent measures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAI-T</td>
<td>62</td>
<td>37.08 (11.86)</td>
<td>59</td>
</tr>
<tr>
<td>BDI</td>
<td>62</td>
<td>8.73 (9.43)</td>
<td>59</td>
</tr>
<tr>
<td>*Negative statements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HTA mothers</td>
<td>36</td>
<td>10.28 (2.25)</td>
<td>29</td>
</tr>
<tr>
<td>LTA mothers</td>
<td>26</td>
<td>10.88 (1.99)</td>
<td>30</td>
</tr>
</tbody>
</table>

*Negative statement total scores range from 6-15 with higher scores reflecting more negative statements.

3.2. **Mothers’ estimates of child avoidance.** The means and standard errors are presented in Figure 2 (upper panel). A 2 group (ANX: CON) x 2 maternal trait anxiety (HTA vs LTA) x 3 condition (safe: threat: ambiguous) repeated measures ANOVA was used to examine mothers’ estimates of children’s distance from the threat animal’s habitat. There were significant main effects of group, \(F(1, 117) = 4.58, p = .034, \eta_p^2 = .04\), condition, \(F(1.87, 218) = 55.18, p < .001, \eta_p^2 = .32\) and maternal trait anxiety, \(F(1, 117) = 12.35, p = .001, \eta_p^2 = .09\), which were subsumed by significant interactions between group and condition, \(F(2, 234) = 3.22, p = .042, \eta_p^2 = .03\), group and maternal trait anxiety, \(F(1, 117) = 4.73, p = .032, \eta_p^2 = .04\), and the three-way interaction between group, condition and maternal trait anxiety, \(F(2, 234) = 5.08, p = .007, \eta_p^2 = .04\).

The simple two-way ANOVA between condition x maternal trait anxiety revealed a significant main effect of condition, \(F(1.77, 120) = 18.20, p < .001, \eta_p^2 = .23\), but the maternal trait anxiety main effect and interaction were not significant, both \(F\)’s < 1.21. Thus,
contrary to expectation, HTA and LTA mothers of ANX children did not differ significantly in estimates of approach-avoidance behaviour. However, the condition x maternal trait anxiety interaction was significant in the CON group, $F(1.92, 114) = 37.42, p < .001, \eta_p^2 = .39$. Follow-up comparisons showed that LTA mothers estimated significantly greater avoidance in both the threat ($p = .001$) and ambiguous ($p = .008$) conditions relative to HTA mothers, but not in the safe condition ($p = .63$).

The analysis of the effects of condition and child group within each level of maternal trait anxiety showed partial support for the hypothesis. The simple two-way ANOVA between condition x group for LTA mothers revealed a significant main effect of condition, $F(1.45, 108) = 20.17, p < .001, \eta_p^2 = .27$, but no other significant effects, $F < .98$. However, the condition x group interaction for HTA mothers was significant, $F(2, 126) = 7.96, p < .001, \eta_p^2 = .11$. Compared to HTA mothers of CON children, HTA mothers of ANX children estimated significantly greater avoidance in the threat condition ($p < .001$), but not in the ambiguous or safe conditions ($p's > .11$) (see Figure 2, upper panel). Thus, significant differences in mothers’ estimates were driven by HTA mothers of CON children who expected significantly greater approach behaviour by their non-anxious children, relative to HTA mothers of ANX children in the threat condition, and relative to LTA mothers of CON children in both the threat and ambiguous conditions.
3.3. Children’s Fear and Avoidance Ratings

*Children's baseline fear and avoidance of a commonly feared animal.* An independent samples t-test used to examine children’s fear ratings of the spider was significant, $t(111) = 2.88$, $p = .005$. Anxious children were significantly more fearful of the spider ($M = 4.92, SD = 2.61$) relative to CON children ($M = 3.57, SD = 2.39$). However, there was no significant group difference in children’s estimates of avoidance of a spider, with
ANX children estimating similar avoidance ($M = 37.34, SD = 16.96$) as CON children ($M = 39.18, SD = 16.01$), $t (111) = -0.59, p = 0.55$.

*Children’s estimates of avoidance in the nature reserve task.* Children’s estimates of avoidance were analysed using a 2 group (ANX: CON) x 2 maternal trait anxiety (HTA; LTA) x 3 condition (safe: threat: ambiguous) repeated measures ANOVA. There was no support found for the hypothesis as the main effects of group and of maternal trait anxiety were not significant ($F$s $< 1.10$). A significant main effect of condition was found, $F (1.97, 230) = 205.04, p < .001$, $\eta_p^2 = .64$, reflecting that all children estimated significantly greater avoidance in the ambiguous relative to the threat and safe conditions, and significantly greater avoidance in the threat than the safe condition (all $p$’s $< .001$). (See Figure 2, lower panel).

*Children’s fear ratings in the nature reserve task.* As in the analyses of mother and child avoidance data, children’s fear ratings were examined using a 2 group (ANX: CON) x 2 maternal trait anxiety ([HTA; LTA]) x 3 condition (safe: threat: ambiguous) repeated measures ANOVA. Contrary to hypothesis, there were no significant main effects of group or maternal trait anxiety and no significant interaction effects ($F$s $< 1$). There was, a significant main effect of condition, $F (2, 216) = 69.45, p < .001$, $\eta_p^2 = .39$. Both groups of children were more fearful in the threat condition relative to the safe and the ambiguous conditions, and significantly more fearful in the ambiguous than in the safe condition (all $p$’s $< .001$) (see Figure 3).
3.4. Supplementary Analyses.

While all 6 threat statements were found to be threatening based on pilot testing, additional analysis was performed to determine whether there was a difference between ANX and CON children’s fear and avoidance estimates as a function of the level of threat of negative statements selected by mothers.

*Children’s Avoidance Estimates:* A 2 group (ANX; CON) x 2 maternal trait anxiety (HTA; LTA) x 3 condition (safe; ambiguous; threat) x 2 negative statements threat level (high; low) repeated measures ANOVA revealed a significant main effect of negative statements threat level, $F(1, 113) = 4.07, p = .046, \eta_p^2 = .03$. Overall, children who were given lower level threat statements estimated significantly greater avoidance ($M = 44.05, SE = 1.05$) relative to children who were given higher level threat statements ($M = 41.08, SE = 1.02$). However, as in the previous analyses, the condition main effect was significant, $F(1.99, 225) = 31.55, p < .001, \eta_p^2 = .22$, but there were no other main or interaction effects (all Fs < 2.43).

*Children’s Fear Ratings:* Supplementary analysis of children’s fear ratings revealed, as in the prior analysis, that there was a significant main effect of condition, $F(2, 216) =$
69.45, $p < .001$, $\eta_p^2 = .39$. However, the main effect of negative statements threat level was not significant and there were no other significant main or interaction effects (all Fs < 2.7). Therefore, mothers’ selection of higher or lower levels of threat statements did not influence the main findings of children’s avoidance estimates as a function of child anxiety group and maternal trait anxiety.

4. Discussion

A major finding of the present study was that there were significant differences in mothers’ estimates of avoidance behaviour of anxious and non-anxious children as a function of mothers’ trait anxiety. However, the direction of the findings indicated that these differences were driven primarily by the estimates of HTA mothers of non-anxious children who expected greater approach behaviour from their non-anxious children. These differences emerged in comparison to HTA mothers of anxious children in the threat condition, and in comparison to LTA mothers of non-anxious children in both the threat and ambiguous conditions. The other main findings were that there was no effect of child or maternal anxiety on children’s own fear and avoidance estimates. All children reported significantly greater fear in the threat compared to the ambiguous and safe conditions, and greater avoidance in the ambiguous relative to the threat and safe conditions.

Mothers’ estimates of child avoidance. Based on previous research (Cobham et al., 1999), we hypothesised that HTA mothers of anxious children would estimate greater avoidance by their anxious children in the threat condition and the ambiguous condition, relative to LTA mothers of anxious children and HTA mothers of control children. Contrary to this, results indicated that HTA and LTA mothers of anxious children did not differ in avoidance estimates of their children. Although HTA mothers of anxious children’s avoidance estimates were significantly larger than HTA mothers of control children’s estimates, HTA mothers of
control children’s estimates also differed significantly from LTA mothers of control children. Moreover, inspection of the data in Figure 2 (upper panel) clearly indicates that these group differences were due to greater approach estimates of the HTA mothers of control children, rather than to greater avoidance estimates by HTA mothers of anxious children relative to other groups.

These findings indicate that mothers’ expectations about their child’s behaviour are influenced by both her own anxiety levels and that of her child. It is unclear why HTA mothers would expect greater approach towards a threatening animal’s habitat. One explanation is that estimates of approach behaviour may reflect upon a desire by HTA mothers to present positively by appearing confident about their non-anxious child’s coping in response to threat. Although this possibility cannot be ruled out, it seems unlikely given that children were not present when mothers completed the nature reserve task.

Another explanation is that estimates of approach behaviour may be due to HTA mothers’ distorted expectations about situational risk and/or child coping. When asked to consider the responses of “typical” children in various salient situations, Micco and Ehrenreich (2008) found that anxious mothers had significantly lower threat perceptions than mothers in the non-clinical group. Thus, in the present study where mothers were providing avoidance estimates of their “own” child, approach estimates of HTA mothers of their non-anxious children may be similar to the lower threat perceptions of “typical” children (i.e., non-anxious children) observed by Micco and Ehrenreich (2008). That similar estimates of approach to threat were not observed in HTA mothers of anxious children could be due to previous experience of their anxious child’s distress and avoidance altering these threat expectations of situational risk and/or child coping in “typical” children overtime.

On the other hand, HTA mothers approach estimates may not be due to distorted appraisals of typical children but to attempts to compensate for their own elevated
perceptions of threat and distress in these situations when their child is not anxious. That is, HTA mothers of non-anxious children may be overcompensating for their own cognitive biases by expecting that when the child is not anxious (and therefore does not have the same biases as they do) mothers should promote approach behaviour, even when caution and avoidance might be adaptive. Therefore, when their child is not anxious, anxious mothers might try to downplay their own threat estimates and inflate the child’s coping ability (i.e., approach behaviour). In accord, there was a notable trend in the present study for HTA mothers of LTA children to select less threatening statements to tell their children relative to other mothers. Nevertheless, it is unclear if attempts to minimise threat and emphasise child coping (i.e., approach) by HTA mothers is helpful in offsetting the development of anxiety. For example, Micco and Ehrenreich (2008) noted that non-anxious children of anxious mothers, who are at a seven-fold increased risk of anxiety (Beidel & Turner, 1997), may experience increased anxiety if their mothers minimise threat in explicitly and potentially threatening situations. However, caution is needed when interpreting the current findings along these lines given that analyses were based on high trait anxiety levels within a non-selected sample of mothers. In future research, mothers should be selected based on their own anxiety diagnostic status.

**Child estimates of avoidance.** Despite differences in maternal expectancy of avoidance in anxious compared to control children, and differences in anxious children’s own estimates of fear of a commonly feared animal compared to control children, anxious children were not more avoidant in the threat or ambiguous conditions of the nature reserve task than their non-anxious peers. Moreover, children’s avoidance was not influenced by maternal trait anxiety.

As mothers were present when children completed the nature reserve task (and not the spider task), one explanation for these findings is that anxious children may have been
reassured by the presence of their mother which consequently reduced their threat appraisals of the various conditions and thus expectations of avoidance. Therefore, in future research, children should be asked to complete the task independently after receiving the relevant information from their mothers. Moreover, unlike the study by Field and Storksen-Coulson (2007) who examined avoidance behaviour in non-selected children, the current sample was comprised of clinically anxious children, who are prone to presenting positively (Dadds, Perrin, & Yule, 1998) and thus, may have minimised their true avoidance responses.

It is also possible that the nature reserve task was not sufficiently specific to the anxiety concerns of anxious children who had a wide variety of anxiety disorders. Nevertheless, previous research has also found that anxious and non-anxious children differ in their responses to ambiguous vignettes (e.g., Bogels & Zigterman, 2000; Waters, Wharton et al., 2008) but not in terms of performance expectations in explicit threat tasks (giving a speech) (e.g., Cobham et al., 1999). Therefore, it is also possible that the threat level of the threat and ambiguous conditions was of a height that elicited fear and avoidance in children in general. On the other hand, as children’s responses were merely estimates of their behaviour, group differences may have been more apparent in tasks when children actually approach novel and/or feared stimuli. For example, the behavioural approach test (BAT), which has been effectively used in behavioural tasks (e.g., Klein, Becker, & Rinck, 2011), could be employed to assess children’s avoidance and fear. Moreover, the Fear Questionnaire (Huijding, Muris, Lester, Field, & Joosse, 2011) would be a more reliable assessment of children’s level of fear in situations with animals rather than the single item measure used in this study.

It should also be noted that a further limitation is that the cross-sectional nature of this study meant that conclusions could not be made regarding the causal or maintaining roles of maternal trait anxiety upon mothers’ expectations of avoidance in children’s anxiety status. Finally, fathers can play an important role in modelling and promoting approach behaviour
and how children learn to decide whether a situation is dangerous and should be avoided (see Bögels & Phares, 2008 for a review). Therefore, future studies should also examine the role of fathers’ expectations of approach-avoidance behaviour in anxious and non-anxious children as well as the effects of paternal trait anxiety.

In conclusion, this study provides preliminary evidence that maternal expectations of children’s avoidance varies as a function of children’s anxiety status and maternal trait anxiety. These findings encourage further research that longitudinally examines maternal, paternal and child approach-avoidance expectations, anxiety and cognitive biases in families of anxious children and those at high risk for the development of these disorders.
REFERENCES


EXPECTATIONS OF APPROACH-AVOIDANCE IN CHILDREN


### Appendix

**Mean Valence Ratings of Animal Statements and Rankings of Animal Statements from Least Positive/Negative to Most Positive/Negative Statement.**

<table>
<thead>
<tr>
<th>Statement Valence Ratings</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td><strong>Negative Animal Statements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.06$^a$</td>
<td>0.83</td>
</tr>
<tr>
<td><strong>Positive Animal Statements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.96$^a$</td>
<td>0.88</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Negative Statements</th>
<th>Statement Intensity Rankings</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td></td>
</tr>
<tr>
<td>1. If you went to the forest, a (animal) might be hiding there, and you might hear its ferocious growl.</td>
<td>2.33$^b$</td>
<td>1.18</td>
<td></td>
</tr>
<tr>
<td>2. (animal) hunt other creatures with their long sharp teeth and claws.</td>
<td>2.74$^b$</td>
<td>1.31</td>
<td></td>
</tr>
<tr>
<td>3. (animal) are very dangerous, and live in dark places in the forest.</td>
<td>3.00$^b$</td>
<td>1.22</td>
<td></td>
</tr>
<tr>
<td>4. I don’t know anyone in Asia who likes (animal)</td>
<td>3.14$^b$</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td>5. ……… (animal) eat other animals, so their favourite food is raw meat and they like to drink blood.</td>
<td>3.30$^b$</td>
<td>1.38</td>
<td></td>
</tr>
<tr>
<td>6. (animal) comes from Asia and are dirty and smelly and carry lots of germs.</td>
<td>3.85$^b$</td>
<td>1.11</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Positive Statements</th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. (animal) eat berries and leaves, and you could feed it out of your hand which would make it so happy</td>
<td>3.72$^c$</td>
<td>1.22</td>
</tr>
<tr>
<td>2. If you went to the forest, a (animal) might come out to see you and you could stroke and cuddle it</td>
<td>3.91$^c$</td>
<td>1.22</td>
</tr>
<tr>
<td>3. (animal) are very friendly and live in the forest</td>
<td>3.97$^c$</td>
<td>0.76</td>
</tr>
<tr>
<td>4. (animal) love playing with children and other animals</td>
<td>4.04$^c$</td>
<td>1.19</td>
</tr>
<tr>
<td>5. (animal) come from Asia and are small and cuddly and their fur is really soft</td>
<td>4.04$^c$</td>
<td>0.91</td>
</tr>
<tr>
<td>6. Everyone in Asia loves (animal) and they like people too</td>
<td>4.10$^c$</td>
<td>1.05</td>
</tr>
</tbody>
</table>

**Note:**

- a = mean animal statement valence rating: 1 (not at all negative/positive) to 5 (extremely negative/positive)
- b = negative animal statement intensity ranking: 1 (least negative) to 6 (most negative)
- c = positive animal statement intensity ranking: 1 (least positive) to 6 (most positive)