

Maternal and Child 'Anxious Cognitions'

1

A Longitudinal Investigation of Maternal and Child 'Anxious Cognitions'

Article

Accepted version

Creswell, C., O'Connor, T. & Brewin, C. (2006). A Longitudinal Investigation of Maternal and Child 'Anxious Cognitions'. *Cognitive Therapy and Research*, 30, 135-147. doi: 10.1007/s10608-006-9021-1.

Publisher Statement: The final version of this article is available at link.springer.com

A Longitudinal Investigation of Maternal
and Child 'Anxious Cognitions'

Abstract

Overestimation of threat and underestimation of coping have been frequently reported amongst anxious adults and children. The current study examines the longitudinal relationship between mothers' anxious cognitions and expectations about their child, and children's anxious cognitions. 54 children (aged 10-11 years) and their mothers reported on their interpretation of ambiguous scenarios at two time points. Mothers also reported on their expectations about their child's reaction to ambiguous situations. Significant cross-sectional associations were found between mother and child anticipation of distress. Associations were most consistent between mothers' expectations and children's cognitions. Furthermore, based on regression analyses, mothers' expectations predicted change in children's anxious cognitions over time. Evidence for a reciprocal relationship, that child cognitions predict change in mothers' expectations, was found for girls. The results provide empirical support for potential influences on the development of children's 'anxious cognitive style', and suggest targets for preventing and reducing maladaptive cognitions in children.

Keywords: anxiety, cognition, children, mothers

A Longitudinal Investigation of Maternal
and Child 'Anxious Cognitions'

Overestimation of danger, threat, and fear, and underestimation of personal ability to cope with threat, is integral to most cognitive models of anxiety (Beck, Emery, & Greenberg, 1985) and the presence of these interpretation biases has been reported amongst highly anxious adults (e.g., Butler & Mathews, 1983; Mathews, Richards, & Eysenck, 1989) and children (e.g., Barrett, Rapee, Dadds, & Ryan, 1996; Muris, Luermans, Merckelbach, & Mayer 2000). These cognitions are proposed to play a causal and maintaining role by inducing anxious mood and avoidant behavior, which in turn reinforce the anxious cognitions. The current study adds to this line of investigation by examining the longitudinal links between anxious cognitions in mothers and their children.

Anxiety disorders tend to co-occur within families (Last, Hersen, Kazdin, Francis, & Grubb, 1987; Last, Hersen, Kazdin, Orvaschel, & Perrin, 1991; Weissman, Leckman, Merikangas, Gammon, & Prusoff, 1984) and parental factors have been implicated in the development of anxiety disorders (e.g., Rapee, 2001). The specific role of parents' anxious cognitions, in particular how they interpret events in terms of the threat they pose and distress they will likely cause, in the transmission of anxiety remains largely unexplored, however. Cross-sectional studies have found significant parent-child resemblance for several categories of anxious cognitions, including attribution style (Seligman, Peterson, Kaslow, Tanenbaum, Alloy, & Abramson, 1984), dysfunctional attitudes (Alloy, Abramson, Tashman, Berrebbi, Hogan, Whitehouse, et al., 2001), Beck's negative cognitive triad (Stark, Schmidt, & Joiner, 1996), and learned resourcefulness and positive attitudes (Brewin, Andrews, & Furnham, 1996; but see Kaslow, Rehm, & Siegel, 1984; Oliver & Berger, 1992).

These findings are consistent with the hypothesis that children develop a cognitive style as a result of modelling by significant others, such as parents (e.g., Alloy, 2001).

If parent cognitions are to be ascribed a causal role in child cognitive vulnerability, then longitudinal data are required, especially to assess if parental cognitive style predicts intra-individual *change* in child cognitions. Accordingly, the current study tests longitudinal hypotheses about intra-individual change in child cognitive vulnerability to anxiety.

In addition to 'direct' modelling, Alloy (2001) suggests that the feedback children receive from significant others about their competencies or appropriate ways to interpret situations may contribute to how their cognitive style develops. Researchers have attempted to operationalize this feedback process in several ways, most notably by assessing parental expectations. Parents' expectations about their child's responses and the child's developing cognitions may, in fact, account for the association between parents' self-referent cognitions and child cognitions. For example, parents' expectations about their child's behavior are associated with their (clarify whose explanatory style) own explanatory style and self-concept (Cole, Maxwell, & Martin, 1997; Fincham & Cain, 1986; Garber & Flynn, 2001; Turk & Bry, 1992). Similar findings were reported for anxiety: anxious parents appear to expect their child to be more anxious, avoidant (Cobham, Dadds, & Spence, 1999) and distressed (Turner, Beidel, Roberson-Nay, & Tervo, 2003) than do less anxious parents. Furthermore, Alloy et al. (2001) reported that a direct association between parent self-referent cognitions and child cognitions was less robust than the relationship between parents' *expectations* about their children and children's self-cognitions.

Directions of effect in anxious cognitions between parents and children

Prospective studies support the hypothesis that the direction of association is from parents' representations of the child to child cognitions. For example, others' appraisals (parents', teachers' and peers') predicted change in children's self-competence in a four-year study (Cole, Jasquez, & Maschman, 2001; see also Alloy et al., 2001). Cole et al. (2001) cite this as support for 'the looking glass hypothesis' (Cooley, 1902; Mead, 1934) that children's self-appraisals are shaped in part by evaluations of them by significant others. Whether the reciprocal relation also exists has received little attention. However a dynamic, reciprocal family-based model of how parent expectations may be transferred to and adopted by children was suggested by Barrett, Rapee, et al. (1996). They found that anxious children's tendencies to make avoidant plans in response to ambiguous scenarios were enhanced after participating in family discussions. The authors reported that parents typically reciprocated – and reinforced – their child's threat-talk and avoidant solutions, suggesting parental communication may be part of a maintaining cycle of interaction (Dadds & Barrett, 1996). The implication is that parents' expectations may be *responsive* to children's own anxious cognitions, and that a unidirectional, parent-child model may misrepresent the process by which children develop sustained cognitive vulnerability to anxiety. The findings highlight the need for more longitudinal investigations to assess the reciprocal connections between parent and child cognitions.

The current study adds to recent research by examining the longitudinal relationship between mothers' anxious cognitions and expectations of their child, and children's anxious cognitions. The methodological advantages of the research include a longitudinal design to assess the reciprocal pattern of mother and child influence and a distinction between maternal cognitions made from the point of view of the self and

about the child. Furthermore, in this study we focussed on a cohort from a single school age-group to minimise the confounding effect of potentially different mechanisms operating on the development of children's cognitions at different points in their development. Specifically we focussed upon late childhood when children make social comparisons and have the capacity to see themselves as others perceive them (Cole et al., 2001), and thus may be particularly influenced by others' expectations of them. In addition the time period assessed included a universal event that presents a naturalistic stressor, the transfer from primary to secondary school. This transition marks a time of change in school environment, academic and social activities (Robinson, Garber, & Hilsman, 1995) and has been associated with increased psychological distress and problem behaviour (e.g., Robinson et al., 1995; Chung, Elias, & Schneider, 1998) and was incorporated to maximise the potential to identify change. For the purposes of the current study 'change' will be assessed by controlling for time 1 variables when testing associations with time 2 variables.

The following hypotheses were tested:

1. Mothers' anxious cognitions (about Threat and Distress), expectations about their child, and children's anxious self-cognitions will be significantly inter-related.
2. Mothers' cognitions and expectations of the child will predict change in children's cognitions over time.

The reciprocal hypothesis was also investigated:

3. Children's cognitions will predict change in mothers' cognitions and expectations of the child over time.

Method

Sample

The participants were 65 children (30 boys and 35 girls) from U.K. school year 6 (aged 10-11 years) and their mothers who responded to a letter inviting them to take part in a study on thoughts and feelings of children and their parents. These families represented 27% of the population invited (n=242; n=199 not invited due to concerns about English proficiency or the presence of significant learning disability in the child) from 14 mixed-sex, state primary schools in North London. These 14 schools were representative of the 47 primary schools in the borough on several key demographic indicators, e.g., the proportion of children eligible for free school meals (41.7% vs. 41.2%) and proportion from an ethnic minority background (55.2% vs. 57.1%). Despite the low take-up rate, participating children appeared to be representative of the larger population based on several indicators (aside from those which served as exclusions, noted above) including gender composition, frequency of special-educational needs, and single-parent family status. Participating children were more likely to be White-British (56 % versus 40%; $\chi^2(2) = 6.18, p < .05$) and less likely to be receiving free school meals (25 % versus 46 %; $\chi^2(1) = 8.03, p < .005$; this is to be at least partly explained by the greater involvement of social services for recently immigrated families, who were disproportionately excluded from this study because of concerns about English proficiency). Thus where there were differences they were likely to reflect the restriction to English speaking families and the tendency for high-socioeconomic risk individuals not to volunteer for research.

11 of the 65 families were not able to participate in the follow-up phase of the study (1 mother deceased, 2 untraceable, 4 children declined, 4 mothers declined).

Fifty-four families, therefore, participated at both the time 1 and time 2 assessments.

Participants and non-participants did not differ on any measures at time 2.

Procedure

Families who agreed to take part in the study were visited in their home or school for the two waves of data collection by doctoral or masters level researchers with a background in psychology who had been trained on the administration of all measures. After being given both written and verbal information about the study, mothers and children signed informed consent forms. Mothers and children completed questionnaires either in different rooms or on different days (within a 2-week period). A researcher was present throughout completion of questionnaires in order to check understanding, respond to queries and to guide the participant through the Ambiguous Situations Questionnaires (ASQ). Depending on the reading skill of the child, s/he filled out each questionnaire independently or with assistance from a researcher. Each family was given £20 payment for taking part at each phase.

The first assessment took place in the final half of the final year at primary school and the second assessment took place in the final half of the first term at secondary school (approximately 6 months later). The study was approved by the University College London and University College London Hospital Research Ethics Committee.

Measures

Child Anxious Cognitions

Ambiguous Situations Questionnaire: child self report (ASQ-c). Following Barrett, Rapee, et al. (1996) and Rapee (personal communication), each child was presented with 12 ambiguous situations that could be interpreted as either threatening or non-threatening (6 physical and 6 social); situations were presented in random

order. For each situation, the child was asked to report on his/her anticipated level of distress (from 0 - 10) in that situation. A total score of Distress was based on the average score across the 12 situations (range 0 – 120). Internal reliability of the scale was good (time 1 $\alpha = .82$; time 2 $\alpha = .84$).

Children were then asked to provide a free response to the question: "What do you think is most likely to have happened?". Responses to this open-ended question were scored by a rater with an undergraduate degree in psychology who was blind to the child's scores on other measures. Free responses regarding the cause of the event were coded as "threat" (e.g. 'the dog is going to bite me') vs. "non-threat" (e.g. 'the dog wants to play') explanations. The number of threat responses was summed across the 12 situations (range 0 - 12). 'Don't know' responses from the child were scored as 'non-threat'. A second independent coder (with an undergraduate degree in psychology) coded a sample of the responses ($n=48$) in order to assess inter-rater reliability. Intra class correlations were assessed using Shrout and Fleiss' third model for fixed raters (Shrout & Fleiss, 1979). A high level of inter rater agreement was found ($ICC = .93$, 95% C.I. .88-.96, $F(47) = 27.59$, $p < .001$).

The child was then presented with a threatening and non-threatening explanation and was asked to indicate which would be more likely of the two possibilities. Order of threat and non-threat items was counter-balanced across the twelve scenarios. The number of threat choices was totalled across the twelve situations. Responses from the free response and forced choice format threat questions correlated highly (time 1: $r(65) = .80$, $p < .001$; time 2: $r(54) = .80$, $p < .001$) so were summed to create a total score for Threat.

Mother Anxious Cognitions

Ambiguous Situations Questionnaire- parent self report (ASQ-p). The adult self-report ASQ-p followed the same administration and scoring procedure as the child self-report ASQ-c. The scenarios, however, were adult-appropriate (Butler & Mathews, 1983). All 16 scenarios (8 physical, 8 social threat) from Butler and Mathews (1983) were administered at time 1 but the final scale comprised 12 scenarios. Two items were removed as there were low levels of variability in threat response and two were removed as they had a negative impact on the inter-item reliability of the threat and distress measures.

A total score for Distress was based on the average score on the 0 - 10 scale across the 12 situations (range 0 - 120; time 1: alpha = .88; time 2: alpha = .90). A score for Threat was derived from the sum of yes/no forced choice responses across 12 situations. Responses from the free response format questions for each of the 12 situations were scored to indicate threat (vs non-threat). The second independent rater coded a sample of the responses (n=48) in order to assess inter-rater reliability. A high level of inter-rater agreement was found for threat (ICC = .89, 95% C.I .81 -.94, $F(47) = 16.95$, $p < .001$). Responses from the free response and forced choice format threat questions correlated highly (time 1: $r(65) = 0.75$, $p < 0.001$; time 2: $r(54) = .70$, $p < .001$), and were, therefore, summed to create a total score for Threat. We refer to this measure hereafter as 'mother self-cognitions'.

Mother Expectations of Child

Ambiguous Situations Questionnaire-parent expectations of their child (ASQ-pc). The same 12 scenarios that were presented to children were also presented to mothers who were asked to predict what their child's response would be. Scores were derived using identical procedures for the child responses, as described above. A total

score for maternal expectations of child's Distress was based on the average score on the 0 - 10 scale across the 12 situations (range 0 - 120; time 1: $\alpha = .76$; time 2: $\alpha = .83$). A score for Threat was the sum of yes/no forced choice responses across the 12 situations. Responses from the free response format questions for each of the 12 situations were scored to indicate threat (vs non-threat). As before the second independent rater coded a sample of the responses ($n=48$) in order to assess inter-rater reliability. A high level of inter-rater agreement was found ($ICC = .93$, 95% C.I. $.88 - .96$, $F(47) = 27.30$, $p < .001$). Again, responses from the free response and forced choice format threat questions correlated highly (time 1: $r(65) = 0.70$, $p < 0.001$; time 2: $r(54) = .84$, $p < .001$) and were summed to create a total score for mothers' expectations of Threat. .

Mothers reported on their expectations of Threat and Distress approximately half an hour after responding to the measure of self-cognitions (ASQ-p) during this delay they completed questionnaires unrelated to threat or distress .

Data Analysis

Data were screened in accordance with Tabachnick and Fidell's (1996) recommendations for screening univariate ungrouped data. The distribution of mothers' self-cognitions of Threat at time 1 was positively skewed ($z = 2.51$) but fitted a normal distribution following log transformation ($z = 1.34$). Analyses involving this variable, therefore, use log transformations.

Bivariate correlations were calculated between mothers' self-cognitions, mother expectations and child cognitions at each time point and longitudinally. Regression analyses testing longitudinal hypotheses were carried out only if the relevant bivariate

longitudinal correlation was significant (Table 2). For each regression analysis, child

gender and ethnicity were entered as control variables as prior research has suggested that these factors may partly explain variation in anxious and other symptoms (Verhulst, 2001). In order to assess intra-individual change in the dependent variable from time 1 to time 2, the time 1 score for the dependent variable was entered on step 1 and the time 1 predictor variable was entered on step 2. Interaction effects with demographic variables (gender and ethnicity) were assessed at the third step by multiplying the predictor and demographic variable scores. Including interaction terms was exploratory and based on the rationale that as these variables may explain variation in anxious phenomena it is plausible that they may react differentially with predictor variables. Interaction effects are only reported if they are significant.

Results

Table 1 provides the means, standard deviations and range for all variables.

Correlational Analyses

(i) *Mothers' self-cognitions (ASQ-p)*. Bivariate correlations between children's cognitions (ASQ-c; Distress and Threat) and mothers' self-cognitions (ASQ-p; Distress and Threat) at time 1 and 2 are given in Table 2. Within-wave correlations indicated one correlation at time 2 (mother and child Distress) that was significant at $p < .05$.

Significant longitudinal correlations were obtained between time 1 mothers' Threat scores and time 2 children's Threat scores. None of the other correlations involving mother self-cognitions were significant at $p < .05$.

(ii) *Mothers' expectations (ASQ-pc)*. Bivariate correlations between children's cognitions (ASQ-c; Distress and Threat) and mothers' expectations about their child (ASQ-pc; Distress and Threat) at time 1 and 2 are also given in Table 2. Within-wave correlations indicated a trend for time 1 mothers' expectations of their child's Distress

and time 1 child's self-reported Distress scores ($r(54) = .26, p = .057$); at Time 2, this correlation was significant ($r(54) = .38, p < .001$). Time 1 mothers' expectations about Threat to the child were associated with time 1 children's Distress scores. Time 2 mothers' expectations about Threat to the child were associated with time 2 children's Threat and Distress scores.

Significant longitudinal correlations were obtained between time 1 mothers' expectations about Distress to the child and time 2 child Threat scores. There were also significant longitudinal links between child cognitions and mother expectations: both time 1 child Distress and Threat were associated with time 2 mother expectations of child Threat (Table 2).

Summary. Significant correlations between mother and child reports were obtained, cross-sectionally and longitudinally, and in relation to both Threat and Distress. However, the associations were more consistent between mother expectations and child cognitions than between mother self-cognitions and child cognitions.

Regression Analyses Testing Longitudinal Hypotheses

The first set of regressions tested the hypothesis that mother self-cognitions predicted change in child cognitions. In the analyses of Threat, although the longitudinal correlation was significant, time 1 mother self-cognitions of Threat did not predict time 2 child cognitions about Threat once time 1 child Threat cognitions, child sex, and ethnicity were controlled (Table 3) (asterisk missing in table 3 for time 1 ASQ threat child). However, time 1 mothers' expectations of child Distress scores did predict *change* in children's Threat scores, predicting an additional 5% of the variance (Table 4).

Reciprocal models were tested where significant longitudinal links between child cognitions and mother expectations of the child were supported by correlational analyses (see Table 2): time 1 child Distress and Threat were both associated with time 2 mother expectations of child Threat. Regression analyses of mother expectations of child Threat cognitions indicated that time 1 child Threat scores did not predict time 2 mothers' Threat expectations, after controlling for time 1 expectations, gender and ethnicity (Table 5). However, exploratory analysis indicated a significant interaction between gender and time 1 children's Threat scores in predicting time 2 mothers' Threat expectation scores. The interaction indicated that the prediction from time 1 child Threat to time 2 mother expectation of child Threat was significantly stronger for girls ($\beta = .54, p = .001$) than boys ($\beta = -.09, p = .59$). Follow-up partial correlation analyses (controlling for time 1 mother Threat expectations) yielded a sizable correlation for girls but a near-zero association for boys (for girls, $r(24) = .63, p = .001$; for boys, $r(24) = .02, p = .92$).

In a separate regression predicting mother Threat expectation from child Distress, we found that time 1 child's Distress did not predict change over time after controlling for stability of mother expectations (Table 6).

Cathy: my own view would be to drop tables with non-sig predictors of change, but let's leave as is b/c leaving more in seems more consistent with reviewer needs

Discussion

Findings from the current study support modest but significant associations between mother and child cognitive vulnerability for anxiety cross-sectionally, longitudinally, and across two dimensions of cognitive vulnerability, threat and distress. Correlation analyses support previous findings in suggesting that children's

cognitive vulnerability is more consistently linked with their mothers' expectations of the child than with mothers' cognitions (Alloy et al., 2001). Longitudinal regression analyses indicated that maternal distress expectations were associated with significant *change* in child cognitive vulnerability; evidence of a reciprocal association was also found, but only for threat expectations in girls. The findings extend research and theory on the familial nature of anxiety.

The strongest cross-sectional and longitudinal pattern of association was found between mothers' expectations about their child and children's cognitions. This is consistent with 'the looking glass hypothesis' and findings in relation to self-competency cognitions (Cole et al., 2001) and attribution style (Alloy et al., 2001). Here, mothers' expectations of how distressed their child would be predicted change in children's threat interpretation over time. This finding extends previous data suggesting that mothers of children with anxiety disorders expected their child to be more distressed (Kortlander, Kendall, & Panichelli-Mindel, 1997) by demonstrating a direction of association from parent to child. This does not necessarily imply a causal link, or even an environmentally-mediated one and future research would benefit from a more detailed analysis of potential transmission processes. One mechanism proposed from cross-sectional research that warrants investigation is that mothers who expect their child to be highly distressed engage in an over-involved pattern of parenting which itself maintains the child's anxious cognitions and behavior (Kortlander et al., 1997; Rubin, Cheah, & Fox, 2001; Wood, McLeod, Sigman, Hwang, & Chu, 2003).

Child cognitions did not generally predict change in mothers' expectations over time, but such a relationship might hold for girls. Specifically, girls' threat interpretation predicted change in their mother's expectations of their daughter's threat

interpretation over time. Differential effects for gender are in keeping with previous reports that mothers' interactions with their anxious children differ for girls and boys (Krohne & Hock, 1991), and that the inclusion of a family component to treatment is particularly efficacious for anxious girls (Barrett, Dadds, & Rapee, 1996). In the case of girls, it appears that mothers were responsive to the child's cognitive vulnerabilities. The extent to which this sort of "responsiveness" is developmentally appropriate and adaptive for the child or is maladaptive and reinforces anxiety-prone thoughts and feelings requires further longitudinal and intervention-based research including observational assessments of the parent-child interaction.

The results of the current study should be interpreted with several limitations in mind. The first concerns generalizability of the findings. All participating children were recruited from schools in a single inner-London borough that represents an extremely diverse population. Participating schools reflected the diversity of the borough, but from the proportion of children identified as having special educational needs and being eligible for free school meals this clearly represents a population with a high level of socio-economic need. In addition, the sample was non-clinical, and the processes identified here may not carry over in clinical samples.

The current sample was deliberately limited to children from a single school year to prevent the confounding effects of developmental changes in parents' expectations about their children (Miller, 1988) and to capitalise on a universal naturalistic stressor. Conclusions can only be drawn from the current study, therefore, about this particular age group of children. For example, it is possible that mothers' cognitions *do* influence the development of their offspring's cognitions, but at an earlier stage in the child's development than assessed here. Creswell (2004) (cathy, can you also cite your BJDP paper somewhere in the discussion) reported that by late

childhood it appears children's 'interpretation style' is fairly stable over time. It is not known whether the same is true in younger populations and if parents' cognitions are more influential at times when interpretation style is less stable. This might occur at younger ages through children observing and imitating their parents' cognitive style. It is also possible that at an even earlier stage, children may inherit a tendency to be alert to threat and prone to increased arousal (and hence distress), a view which is in keeping with genetic studies which suggest children inherit an 'anxious vulnerability' (e.g., Andrews, Stewart, Allen, & Henderson, 1990). On the other hand, others have reported that genetically-mediated similarities may become more pronounced as children become older (Eley & Stevenson, 1999; Feigon, Waldman, Levy, & Hay, 1997), a view in keeping with the greater association found here at the later time point. In addition whether the findings are specific to the age group or the experience of secondary school transition cannot be deciphered. Future longitudinal studies covering wider age ranges, and in particular utilising measures of interpretation bias that can be applied with children from much younger ages, would help resolve these puzzles. Including populations where school transitions occur at different ages would help differentiate between age and event related findings.

Parent information in the current study was limited to mothers' reports. In all cases, the mother was viewed as the 'primary caregiver' within the family. Where gender differences were found it is unclear, therefore, whether the effect was specific to girls or to the relationship between girls and their mothers (MacBrayer, Milich, & Hundley, 2003). It is of course extremely unlikely that in a two-parent family only one parent has an influence over the development of their child's cognitions. Often inconsistent findings have been reported in relation to the differential influence of mothers and fathers, and findings are often compromised by a low number of

participating fathers (Bogels, van Dongen, & Muris, 2002). The inclusion of fathers, though often difficult in practice, is a priority area for future studies.

Whilst prediction of a short-term change in children's cognitive style is noteworthy, the proportion of the variance accounted for by mothers' expectations was still fairly small. Other potential influences on the development and maintenance of children's cognitions clearly deserve attention, for example measures of parenting and life events. The largest proportion of the variance in children's cognitions found here was consistently predicted by earlier cognitions.

Despite these limitations, the current study has provided support for the influence of mothers' expectations about their child, in particular about their child's emotional vulnerability, on change in children's anxious cognitions over time. These findings suggest parental cognitive processes, in particular maternal expectations, may be a useful target in the treatment or prevention of anxiety disorders in children.

References

Alloy, L. B. (2001). The developmental origins of cognitive vulnerability to depression: Negative interpersonal context leads to personal vulnerability. *Cognitive Therapy and Research, 25*, 349-351.

Alloy, L. B., Abramson, L. Y., Tashman, N. A., Berrebbi, D. S., Hogan, M. E., Whitehouse, W. G., et al. (2001). Developmental origins of cognitive vulnerability to depression: Parenting, cognitive, and inferential feedback styles of the parents of individuals at high and low cognitive risk for depression. *Cognitive Therapy and Research, 25*, 397-423.

Andrews, G., Stewart, G. W., Allen, R., & Henderson, A. S. (1990). The genetics of six neurotic disorders: A twin study. *Journal of Affective Disorders, 19*, 23-29.

Barrett, P. M., Dadds, M. M., & Rapee, R. M. (1996). Family treatment of childhood anxiety: A controlled trial. *Journal of Consulting and Clinical Psychology, 64*, 333-342.

Barrett, P. M., Rapee, R. M., Dadds, M. M., & Ryan, S. M. (1996). Family enhancement of cognitive style in anxious and aggressive children. *Journal of Abnormal Child Psychology, 24*, 187-203.

Beck, A. T., Emery, G., & Greenberg, R. L. (1985). *Anxiety disorders and phobias: A cognitive perspective*. New York: Basic Books.

Bogels, S. M., & Zigterman, D. (2000). Dysfunctional cognitions in children with social phobia, separation anxiety disorder and generalised anxiety disorder. *Journal of Abnormal Child Psychology, 28*, 205-211.

Bogels, S.M., van Dongen, L., & Muris, P. (2003). Family influences on dysfunctional thinking in anxious children. *Journal of Infant and Child Development*, *12*, 243-252.

Brewin, C. R., Andrews, B., & Furnham, A. (1996). Intergenerational links and positive self-cognitions: Parental correlates of optimism, learned resourcefulness, and self-evaluation. *Cognitive Therapy and Research*, *20*, 247-263.

Butler, G., & Mathews, A. (1983). Cognitive processes in anxiety. *Advances in Behavior Research and Therapy*, *5*, 51-60.

Cobham, V. E., Dadds, M. M., & Spence, S. H. (1999). Anxious children and their parents: What do they expect? *Journal of Clinical Child Psychology*, *28*, 220-231.

Cole, D. A., Jacquez, F. M., & Maschman, T. L. (2001). Social origins of depressive cognitions: A longitudinal study of self-perceived competence in children. *Cognitive Therapy and Research*, *25*, 377-395.

Cole, D. A., Maxwell, S. E., & Martin, J. M. (1997). Reflected self-appraisals: Strength and structure of the relation of teacher, peer and parent ratings to children's self-perceived competencies. *Journal of Educational Psychology*, *89*, 55-70.

Cooley, C. H. (1902). *Human nature and the social order*. New York: Scribner.

Creswell, C. S. (2004) The development of anxious cognitions in children. Unpublished doctoral thesis, University of London.

Dadds, M. M. & Barrett, P. M. (1996). Family processes in child and adolescent anxiety and depression. *Behaviour Change*, *13*, 231-239.

Eley, T. C., & Stevenson, J. (1999). Exploring the covariation between anxiety and depression symptoms: A genetic analysis of the effects of age and sex. *Journal of Child Psychology and Psychiatry*, *40*, 1273-1284.

Feigon, S. A., Waldman, I. D., Levy, F., & Hay, D. A. (1997). Genetic and environmental influences on various anxiety disorder symptoms in children. *Behavior Genetics*, *27*, 588.

Fincham, F. D., & Cain, K. M. (1986). Learned helplessness in humans: A developmental analysis. *Developmental Review*, *6*, 301-333.

Garber, J., & Flynn, C. (2001). Predictors of depressive cognitions in young adolescents. *Cognitive Therapy and Research*, *25*, 353-376.

Hadwin, J., Frost, S., French, C. C., & Richards, A. (1997). Cognitive processing and trait anxiety in typically developing children: Evidence for an interpretation bias. *Journal of Abnormal Psychology*, *106*, 486-490.

Kaslow, N. J., Rehm, L. P., & Siegel, A. W. (1984). Social-cognitive and cognitive correlates of depression in childhood. *Journal of Abnormal Child Psychology*, *12*, 605-620.

Kortlander, E., Kendall, P. C., & Panichelli-Mindel, S. M. (1997). Maternal expectations and attributions about coping in anxious children. *Journal of Anxiety Disorders*, *11*, 297-315.

Krohne, H. W., & Hock, M. (1991). Relationships between restrictive mother-child interactions and anxiety of the child. *Anxiety Research*, *4*, 109-124.

Last, C. G., Hersen, M., Kazdin, A. E., Francis, G., & Grubb, H. J. (1987). Psychiatric illness in the mothers of anxious children. *American Journal of Psychiatry*, *144*, 1580-1583.

- Last, C. G., Hersen, M., Kazdin, A. E., Orvaschel, H., & Perrin, S. (1991). Anxiety disorders in children and their families. *Archives of General Psychiatry*, *48*, 928-936.
- Mathews, A., Richards, A., & Eysenck, M. (1989). Interpretation of homophones related to threat in anxiety states. *Journal of Abnormal Psychology*, *98*, 31-34.
- Mead, G. H. (1934). *Mind, self and society*. Chicago: University of Chicago Press.
- MacBrayer, E. K. , Milich, R., & Hundley, M. (2003). Attributional biases in aggressive children and their mothers. *Journal of Abnormal Psychology*. *112*, 698-708.
- Miller, S. A. (1988). Parents' beliefs about children's cognitive development. *Child Development*, *59*, 259-285.
- Muris, P., Luermans, J., Merckelbach, H., & Mayer, B. (2000). 'Danger is lurking everywhere'. The relation between anxiety and threat perception abnormalities in normal children. *Journal of Behavior Therapy & Experimental Psychiatry*, *31*, 123-136.
- Oliver, J. M., & Berger, L. S. (1992). Depression, parent-off-spring relationships and cognitive vulnerability. *Journal of Social Behavior and Personality*, *7*, 415-429.
- Rapee, R. M. (2001). The development of generalized anxiety. In M. W. Vasey & M. M. Dadds (Eds.), *The developmental psychopathology of anxiety* (pp. 1045-1095). New York: Oxford University Press.

Rubin, K. H., Cheah, C. S. L., & Fox, N. (2001). Emotion regulation, parenting and display of social reticence in preschoolers. *Early Education and Development, 12*, 97-115.

Seligman, M. E. P., Peterson, C., Kaslow, N. J., Tanenbaum, R. L., Alloy, L. B., & Abramson, L. Y. (1984). Attributional style and depressive symptoms among children. *Journal of Abnormal Psychology, 93*, 235-238.

Shrout, P. E., & Fleiss, J. L. (1979). Intraclass correlations: Uses in assessing rater reliability. *Psychological Bulletin, 8*, 420-428.

Stark, K. D., Schmidt, K. L., & Joiner, T. E. (1996). Cognitive triad: Relationship to depressive symptoms, parents' cognitive triad, and perceived parental messages. *Journal of Abnormal Child Psychology, 24*, 615-631.

Teti, D. M., & Gelfand, D. M. (1991). Behavioral competence among mothers of infants in the first year: The mediational role of maternal self-efficacy. *Child Development, 62*, 918-929.

Turk, E. & Bry, B. H. (1992). Adolescents' and parents' explanatory styles and parents' causal explanations about their adolescents. *Cognitive Therapy and Research, 16*, 349-357.

Turner, S. M., Beidel, D. C., Roberson-Nay, R., & Tervo, K. (2003). Parenting behaviors in parents with anxiety disorders. *Behaviour Research and Therapy, 41*, 541-554.

Verhulst, F. C. (2001). Community and epidemiological aspects of anxiety disorders in children. In W. K. Silverman & P. D. A. Treffers (Eds.), *Anxiety disorders in children and adolescents: Research, assessment and intervention* (pp. 273-292). Cambridge: Cambridge University Press.

Weissman, M. M., Leckman, J. F., Merikangas, K. R., Gammon, D., & Prusoff, B. A. (1984). Depression and anxiety disorders in parents and children. *Archives of General Psychiatry*, *41*, 845-852.

Wood, J. J., McLeod, B. D., Sigman, M., Hwang, W., & Chu, B. C. (2003). Parenting and childhood anxiety: theory, empirical findings, and future directions. *Journal of Child Psychology and Psychiatry*, *44*, 134-151.

Table 1

Means, standard deviations and ranges of child and mother ASQ scores

	Time 1		Time 2	
	<i>n</i> =54		<i>n</i> =54	
	<i>Mean (sd)</i>	<i>Range</i>	<i>Mean (sd)</i>	<i>Range</i>
Child measures				
ASQ Distress (c)	51.00 (19.85)	19-95	51.22 (22.70)	0-101
ASQ Threat (c)	20.56 (4.70)	13-31	18.65 (4.84)	12-31
Mother measures				
ASQ Distress (p)	58.09 (22.31)	0-101	56.00 (22.60)	0-91
ASQ Threat (p)	19.85 (4.40)	14-31	18.70 (4.01)	13-28
ASQ Distress (pc)	66.24 (15.72)	40-105	64.15 (19.68)	10-106
ASQ Threat (pc)	22.24 (4.00)	13-31	20.07 (4.59)	12-32

Note. ASQ: Ambiguous Situations Questionnaire; c: child anxious cognition; p:

parent self-cognition; pc: parent expectations about the child

Table 2

Bivariate correlations between children's cognitions and mothers' self-cognitions and expectations

		Mother report								
		Time 1				Time 2				
		ASQ-p Distress	ASQ-p Threat	ASQ-pc Distress	ASQ-pc Threat	ASQ-p Distress	ASQ-p Threat	ASQ-pc Distress	ASQ-pc Threat	
Child cognition	Time 1	ASQ-c Distress	.09	.10	.26	.29*	.16	.08	.25	.27*
		ASQ-c Threat	-.03	.24	.05	.15	-.01	.16	.12	.34*
	Time 2	ASQ-c Distress	.15	.17	.24	.23	.27*	.05	.38**	.30*
		ASQ-c Threat	.04	.28*	.27*	.24	.02	.11	.20	.44***

Note. ASQ: Ambiguous Situations Questionnaire; c: child anxious cognition; p: parent self-cognition; pc: parent expectations about the child

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 3

Predicting time 2 child threat cognitions from time 1 mother self-cognitions of threat

Predictor	B	SE(B)	β	Increment in R ²
Step 1				.46***
Gender	.24	1.02	.03	
White UK	-1.64	1.09	-.17	
Time 1 ASQ Threat (c)	.62	.12	.60	
Step 1				.01
Time 1 ASQ Threat (p)	6.53	5.92	.12	

Note. ASQ: Ambiguous Situations Questionnaire; c: child anxious cognition; p: parent self-cognition

*** $p < .001$

Table 4

Predicting time 2 child threat cognitions from time 1 mother expectations of child distress

Predictor	B	SE(B)	β	Increment in R ²
Step 1				.46***
Gender	.24	1.02	.03	
White UK	-1.64	1.09	-1.71	
Time 1 ASQ-c Threat	.62	.12	.60***	
Step 2				.05*
Time 1 ASQ-pc Distress	.07	.03	.23*	

Note. ASQ: Ambiguous Situations Questionnaire; c: child anxious cognition; pc: parent expectations about the child

* $p < .05$; *** $p < .001$

Table 5

Predicting time 2 mother expectations of child threat from time 1 child threat cognitions

Predictor	B	SE(B)	β	Increment in R ²
Step 1				.46***
Gender	-.37	.98	-.04	
White-UK	-1.87	.96	-.21	
Time one ASQ Threat (p-c)	.72	.12	.63***	
Step 2				.03
Time one ASQ Threat (c)	.19	.11	.20	
Step 3				.05
Interaction of time one ASQ Threat (c) and Gender	.45	.20	1.14*	
Interaction of time one ASQ Threat (c) and White UK	-.10	.23	-.22	

Note. ASQ: Ambiguous Situations Questionnaire; c: child anxious cognition; pc:

parent expectations about the child

* $p < .05$; *** $p < .001$

Table 6

Predicting time 2 mother expectations of child threat from time 1 child distress

cognitions

Predictor	B	SE(B)	β	Increment in R ²
Step 1				.46***
Gender	-.37	.98	-.04	
White UK	-1.87	.96	-.04	
Time one ASQ Threat (p-c)	.72	.12	.63***	
Step 2				.002
Time one ASQ Distress (c)	.001	.03	.05	

Note. ASQ: Ambiguous Situations Questionnaire; c: child anxious cognition; pc:

parent expectations about the child

*** $p < .001$