Maternal Control Behavior and Locus of Control: Examining Mechanisms in the Relation Between Maternal Anxiety Disorders and Anxiety Symptomatology in Children

Kimberly D. Becker,
Department of Mental Health, Johns Hopkins Bloomberg School of Public Health, 624 N. Broadway, 8th Floor, Baltimore, MD 21205, USA

Golda S. Ginsburg,
Department of Psychiatry and Behavioral Sciences, Division of Child and Adolescent Psychiatry, The Johns Hopkins University School of Medicine, 550 N. Broadway, Suite 202, Baltimore, MD 21205, USA

Janine Domingues, and
Department of Psychology, The University of Connecticut, 406 Babbidge Road, Unit 1020, Storrs, CT 06269-1020, USA

Jenn-Yun Tein
Prevention Research Center and Department of Psychology, Arizona State University, PO Box 876005, Tempe, AZ 85287-6005, USA

Kimberly D. Becker: kbecker@jhsph.edu; Golda S. Ginsburg: gginsbu1@jhmi.edu; Janine Domingues: janine.domingues@uconn.edu; Jenn-Yun Tein: atjyt@asu.edu

Abstract

This study tested components of a proposed model of child anxiety and examined the mediational roles of (1) maternal control behavior, (2) maternal external locus of control, and (3) child external locus of control in the association between maternal and child anxiety. Thirty-eight clinically anxious mothers and 37 nonanxious mothers participated along with one of their children aged 6 to 14 (52.0% female; 78.7% Caucasian). Path analysis indicated that the overall model fit the data very well. Analyses also indicated that child external locus of control mediated the associations between (1) maternal and child anxiety and (2) maternal control behavior and child anxiety. Maternal anxiety was not related to maternal control behavior and maternal external locus of control was not associated with child anxiety. Findings are discussed in the context of theoretical models (e.g., Chorpita and Barlow 1998) regarding the transmission of maternal anxiety to their children and the specific roles of maternal behavior and child locus of control.

Keywords

Anxiety; Control; Locus of control; Parenting

Anxiety disorders aggregate in families (Beidel and Turner 1997; Last et al. 1987). Children of parents with anxiety disorders are approximately seven times more likely to develop anxiety disorders than are children of parents without clinical levels of anxiety (Turner et al. 1987). Biological and genetic factors have been estimated to account for approximately 50%

Correspondence to: Kimberly D. Becker, kbecker@jhsph.edu.

of the variance in this relationship (Eley et al. 2003), but less is known about the environmental mechanisms through which parental anxiety increases a child's psychological vulnerability for anxiety. One environmental mechanism that appears promising is parental control behavior.

Parental control generally refers to parental behaviors characterized by high levels of parental decision-making and overprotection, and low levels of autonomy granting (Ballash et al. 2006a; McLeod et al. 2007). Chorpita and Barlow (1998) theorized that an early family environment characterized by high levels of parental control (i.e., low autonomy granting) increases the psychological vulnerability for a child developing excessive anxiety. Parental control behaviors may increase child anxiety by teaching children that there is a constant threat in their environment and that they cannot manage that threat on their own. Parental control behaviors also establish expectations that the world is scary or threatening and deprive children of opportunities to develop mastery over their environment (Chorpita and Barlow 1998; Ginsburg and Schlossberg 2002; Rapee 1997). Indeed, research has demonstrated a positive association between parental control behavior and child anxiety (e.g., Ginsburg et al. 2004a; Gruner et al. 1999; McLeod et al. 2007; Moore et al. 2004; Muris et al. 2004).

Theoretical models posit that certain parenting behaviors may be more prevalent among anxious parents (Ginsburg and Schlossberg 2002). For example, research suggests that anxious parents catastrophize and withdraw to a greater extent than do nonanxious parents (Whaley et al. 1999; Woodruff-Borden et al. 2002). However, several studies have found that anxious and nonanxious parents display similar parenting practices when it comes to behavioral control (Ginsburg et al. 2004a; Moore et al. 2004; Turner et al. 2003; Woodruff-Borden et al. 2002) and that behavioral differences have more to do with child diagnostic status than with that of the mother. To date, the extent to which parental control behavior may serve as a mechanism between parental anxiety and child anxiety has not been tested.

There exist many shortcomings in the literature that examines parental control behavior, including failure to assess parental and child anxiety within the same study, reliance on single reporters, and lack of attention to mediational models (Ballash et al. 2006a; Wood et al. 2003). Additionally, the divergent operationalization of parental control behavior (e.g., overinvolvement, low autonomy granting) across studies makes synthesis of findings difficult. Assessment methods of parental control also differ across studies, with stronger associations between parental control behavior and child anxiety demonstrated in observational studies compared to questionnaire studies (McLeod et al. 2007).

The transmission of anxiety from parent to child is likely complex, and it is plausible that in addition to parenting behaviors, other factors such as parental cognitions play a role (Hagekull et al. 2001; Wheatcroft and Creswell 2007). One cognitive construct that appears promising is locus of control. Locus of control is characterized along a continuum and reflects the degree to which an individual expects that an outcome is contingent on his or her own behavior (i.e., internal locus of control) versus contingent on external forces such as luck, chance, other people, or unknown forces (i.e., external locus of control; Rotter 1966, 1975, 1990). There exists a rich empirical history demonstrating an association between external locus of control and symptoms of anxiety across a variety of adult and child samples (e.g., Ballash et al. 2006b; Beekman et al. 2000; Chorpita et al. 1998; Kennedy et al. 1998).

Parental locus of control may be a mechanism of anxiety transmission from parent to child in a number of different ways. First, anxious parents may be more likely than nonanxious parents to espouse an external locus of control, and these cognitions, in turn, may be

modeled by their children, thereby diminishing children's perceptions of control and increasing their anxiety. Ollendick (1979) found a positive association between parental external locus of control and child anxiety, using the Nowicki-Strickland Locus of Control Scale for Adults (Nowicki and Duke 1974) and the State-Trait Anxiety Inventory for Children (Spielberger 1973). In a longitudinal study, parental reports of low perceived control before their children's third birthdays were associated with child internalizing (as well as externalizing) difficulties at age four (Hagekull et al. 2001). However, several researchers have not found a relation between parents' locus of control and children's locus of control (e.g., Ackerman and Ackerman 1989; Hoffman and Levy-Shiff 1994) or findings were moderated by either child or parent gender (e.g., Chandler et al. 1980; Ollendick 1979).

A second possibility is that parents with an external locus of control may engage in parenting behaviors (e.g., coercion, overcontrol, withdrawal) that amplify anxiety in their children. Research suggests that external locus of control is associated with coercive parenting (Bugental et al. 1989), but to date, the association between parental external locus of control and parental control behavior remains understudied. Moreover, the question regarding the relative influence of behavioral and cognitive factors on child anxiety remains unanswered.

In addition to the contribution of parental control behavior to child anxiety, Chorpita and Barlow (1998) hypothesized that a child's external locus of control mediates the relationship between parental control behavior and child anxiety. A child whose parent limits his/her autonomy in the environment may develop a diminished sense of control and the expectation that outcomes come about as a result of external forces rather than his/her own behavior, thereby increasing risk for the development of anxiety. Initial research on Chorpita and Barlow's (1998) model indicated that higher child external locus of control mediated the association between parental control behavior and child reports of negative affect (Chorpita et al. 1998). A more recent study using a sample of undergraduate students demonstrated a similar pattern of results such that locus of control mediated the association between family control behavior and self-reported anxiety symptoms (Ballash et al. 2006b). Specifically, as family control behavior increased, youths' internal locus of control (in this study, locus of control over anxiety-related symptoms and problems) diminished and was related to an increase in anxiety symptoms.

The present study replicates and extends this body of work by examining a model of child anxiety comprised of maternal anxiety, maternal control behavior, and maternal and child external locus of control. Additionally, this study examines the mediational roles of (1) maternal control behavior, (2) maternal external locus of control, and (3) child external locus of control in the association between maternal anxiety and child anxiety. This study builds upon previous research by including information regarding both maternal and child anxiety, using multiple informants, examining one specific subdimension of parental control behavior (i.e., low parental autonomy granting), including cognitive factors (i.e., maternal and child external locus of control), and examining the association between maternal external locus of control and maternal control behavior. Based on the extant literature, two hypotheses were tested: (1) The association between maternal anxiety and child anxiety would be mediated by (a) maternal control behavior, (b) maternal external locus of control, and (c) child external locus of control and (2) the association between maternal factors (i.e., control behavior and external locus of control) and child anxiety would be mediated by child external locus of control (see Fig. 1).

Method

Participants

Seventy-five mothers, 38 (anxious mothers) meeting a DSM-IV diagnosis for an anxiety disorder and 37 (healthy mothers) who did not meet criteria for any psychiatric disorder, served as participants, along with one of their children (52.0% females) who was between the ages of 6 and 14 years (M=9.03, SD=1.68, Mdn=9.00; see Table 1). Mothers ranged in age from 26 to 54 years (M=39.91, SD= 5.80). Most of the participating mothers were currently married (81.3%) and the majority of children were Caucasian (78.7%; 15% were African American) and from families from upper income backgrounds (58.7% annual income $80,000 or higher). The two groups did not differ significantly in terms of parent income, parent age, child age, or child gender. However, there were significantly more African American participants in the children of the healthy mothers group (χ^2=9.40, p<0.05).

Diagnoses were determined using the Anxiety Disorders Interview Schedule: Lifetime Version (ADIS; Brown et al. 1994) for mothers and the Anxiety Disorders Interview Schedule: Child Version (ADIS-C; Silverman and Albano 1996) for children. Trained Masters and Ph.D. level clinicians conducted all ADIS interviews. In order to be included in the anxious group, mothers had to receive a primary diagnosis of either a current or lifetime anxiety disorder. All mothers in the anxious group received a current anxiety disorder diagnosis. Primary diagnoses for the anxious mothers were as follows: generalized anxiety disorder (n=21), social phobia (n=6), panic disorder with agoraphobia (n=5), panic disorder without agoraphobia (n=3), specific phobia (n=2), and obsessive-compulsive disorder (n=1). Approximately 74% of mothers met criteria for a secondary comorbid disorder, most commonly another anxiety (n=22) or mood (n=5) disorder. Over half the mothers (55.3%) were currently receiving outpatient psychiatric treatment for their anxiety disorder. Specifically, 91% of these women reported receiving pharmacotherapy and 57.1% reported receiving psychotherapy either currently or at some point in the past.

Non-anxious mothers also completed an initial in-person evaluation in order to assess whether their families met inclusion/exclusion criteria. Mothers qualified as "healthy" only if there was no current or lifetime diagnosis of an anxiety or mood disorder or any current psychiatric condition (e.g., suicidality, current substance use disorder).

Inclusion criteria for both groups required each family to have a child between the ages of 7 and 12 (ultimately, the study included two children who were 6 and two children who were 13 to 14 years old) who had no current or previous anxiety disorder diagnosis. Children were excluded for the presence of a medical or psychiatric condition contraindicating study intervention (e.g., suicidality) or if they were currently receiving psychological or pharmacological treatment for anxiety reduction. Mothers were excluded if they had a medical or co-morbid psychiatric condition that contraindicated study intervention (e.g., suicidality, current substance use disorder).

A total of 51 families completed an initial in-person evaluation for possible enrollment in the "anxious" group. Nine families were excluded because the child met criteria for an anxiety disorder, one family was excluded because the mother met criteria for major depression and not anxiety as the primary disorder, and one family was excluded because neither parent met criteria for an anxiety disorder. Additionally, two families in which the father presented as the anxious parent were not included in the present analyses; thus, our "anxious" sample comprised 38 mothers. Fifty families with "healthy" parents completed an initial in-person evaluation. Nine mothers who either had a lifetime diagnosis of major depressive disorder or were currently on medication for a mood disorder were excluded, as

was an additional family who was unable to complete a full assessment. Three families whose father participated in the assessment were not included in the present analyses. The final sample size of healthy mothers was 37.

Procedure

Anxious mothers were recruited through advertisements in local papers, mailings to local physicians and psychiatrists, and community flyers to participate in a study examining the impact of an anxiety prevention program (Ginsburg 2009) on their non-anxious offspring. Non-anxious mothers were recruited as healthy controls and responded to flyers describing a study of stress and coping in families. All families who contacted the project responded to a series of screening questions designed to identify ineligible families according to the exclusion criteria prior to the full assessment battery. Families that successfully passed the phone screen were scheduled for in-person evaluations. During this initial evaluation all measures for the present study were collected. Prior to completing the evaluation all participants completed written informed consent.

Measures

Maternal anxiety—Maternal anxiety was measured via the widely used Brief Symptom Inventory (BSI; Derogatis 1993), a 53-item instrument assessing symptom patterns across 9 symptom dimensions (e.g., anxiety, depression). Mothers indicated how distressed they had been by various symptoms (e.g., poor appetite, feeling tense or keyed up) during the previous week using a 5-point scale (0 = not at all; 4 = extremely). For the purposes of this study, anxiety subscale T-scores served as a dimensional indicator of maternal anxiety. The internal consistency for the 6-item anxiety scale was 0.83.

Child anxiety—Child anxiety was assessed using the Screen for Child Anxiety-Related Emotional Disorders – Parent and Child Versions (SCARED, Birmaher et al. 1997, 1999). The SCARED is a 41-item questionnaire measure of pediatric anxiety that has been demonstrated to differentiate between clinically anxious and nonanxious psychiatrically ill youth (Birmaher et al. 1997). Children and their mothers responded to items (on separate forms) using a 3-point Likert-type scale describing the degree to which statements are true about them (not true or hardly ever true, somewhat true or sometimes true, very true or often true). Sample items on the child version include: "I worry about going to school," "I worry about sleeping alone," and "I worry about being as good as other kids." In the present study, the SCARED Total Score was used and derived by summing all 41 items. Higher scores reflected higher levels of anxiety. Internal consistency was 0.92 for the child-report SCARED Total score and 0.92 for the parent-report SCARED total score.

Parent and child reports were positively correlated ($r= 0.22$, $p=0.05$). To take advantage of reports from both the child and parent and minimize the biases inherent in reliance on either parent or child report alone, we standardized the total scores on the parent and child versions and calculated the sum of the standardized scores. The resultant sum provided an indicator of child anxiety that was used as the dependent variable in subsequent analyses.

Maternal control behavior—Maternal control behavior was measured by child reports on the Egna Minnen av Barndoms Uppfostran - My memories of upbringing - Child version (EMBU-C; Castro et al. 1993). The EMBU is gaining a body of support for its sound psychometric properties and its use in research related to child anxiety (Gruner et al. 1999; Markus et al. 2003; Muris et al. 1996, 2006). Children responded to 10 items on the control subscale ("Your parents tell you what you should do after school hours") and 10 items on the anxious rearing subscale ("Your parents do not allow you to do as many things as other

children") of the EMBU. Items were answered on a four-point likert scale from 1 (no, never) to 4 (yes, most of the time). The internal consistency of this 20-item measure was 0.79.

Maternal external locus of control—Maternal external locus of control was measured by a 5-item external locus of control subscale from the Family Functioning Scale (Bloom 1985). Mothers responded to items (e.g., "My family feels that they have very little influence over the things that happen to them") using a four-point scale ranging from 1 (very untrue for my family) to 4 (very true for my family). The internal consistency for this scale was 0.71.

Child external locus of control—Children responded to 16 items on the Anxiety-Specific Attributions of Control Scale (ASAC; Ginsburg and Drake 1998), an instrument designed to assess locus of control specific to anxiety-related situations and that has demonstrated positive associations with child anxiety in other samples (Ginsburg et al. 2004b). This anxiety-specific instrument was utilized in the present study because a number of scholars have suggested that perceptions of control specific to threatening situations may be more strongly related to anxiety than are general perceptions of control (Ginsburg et al. 2004b; Rapee et al. 1996; Weems et al. 2007). Children rated each item using a 4-point Likert scale (0 = not at all true; 3 = very true). The ASAC yields four subscales: internal control over success, internal control over failure, external control over success, and external control over failure. Due to high correlation (r=0.63), we combined the external control over success ("When I am able to stop worrying/feeling scared, I don't always know the reason why.") and external control over failure ("If I can't stop feeling afraid, it's because I don't have someone to help me.") scales to provide our outcome measure of total external locus of control. The internal consistency for this scale was 0.82.

Results

Preliminary Analyses

Means and standard deviations for each measure are presented in Table 2 by parent diagnostic group and for the total sample. As expected, anxious mothers scored significantly higher than healthy mothers on the BSI. Standardized scores on the SCARED were significantly higher for children of anxious mothers than for children of healthy mothers. There were no significant differences between anxious mothers and healthy mothers for control behavior or external locus of control. Children of anxious mothers did not differ from children of healthy mothers in external locus of control. We examined the skewness and kurtosis statistics for scores on each measure and found them to be within the acceptable range according to published standards in the field (< 2 for skewness, < 7 for kurtosis; West et al. 1995), therefore, no transformation was necessary.

Prior to conducting analyses related to the study hypotheses, we examined child gender, child age, and parent age as potential covariates with our dependent variables. The only significant relation found was for parent age. Specifically, parent age was significantly negatively correlated with maternal control behavior (r=−0.35); thus, we controlled for parent age in our mediation analyses involving that particular dependent variable.

Additional correlational analyses were conducted among the primary variables. Multicollinearity was not a concern for the regression equations because of the resultant low to moderate correlations (Table 3) and appropriate tolerance statistics within each regression. Correlational analyses revealed significant positive associations between maternal anxiety as reported on the BSI and (1) maternal external locus of control, (2) child external locus of control, and (3) child anxiety. Maternal anxiety was not associated with maternal control behavior. Maternal control behavior was positively related to child external

locus of control and child anxiety. Maternal external locus of control and maternal control behavior were unrelated. Additionally, maternal external locus of control was not associated with child external locus of control or child anxiety. Finally, child external locus of control was positively related to child anxiety.

Path Analysis and Hypothesis Testing

Path analysis with Mplus software (Version 5.1) was used to examine the fit of the full model and to examine the mediation models. MPlus utilizes full information maximum likelihood (FIML) estimation with missing data, which directly estimates the parameters that best fit all the available raw data and has been shown to be superior to traditional missing data techniques (see Schafer and Graham 2002). Because of the relatively small sample, the bootstrap method was used for estimating the standard errors of parameter estimates and the bias-corrected confidence interval of the mediation effect. Bootstrapping is considered superior to other approaches for testing mediation hypotheses in small samples (MacKinnon et al. 2002; Preacher and Hayes 2008). The "model indirect" command was used to provide an estimate of the indirect effects within the meditational analyses. In evaluating the overall fit of the model, nonsignificance of the chi-square indicates a good fit. Additionally, goodness of fit is indicated by root mean square error of approximation (RMSEA) <0.06, standard root mean square residual (SRMR) <0.08, and comparative fit index (CFI) of >0.95 (Hu and Bentler 1999).

Figure 1 depicts the results of the test of the full model examining the associations among maternal anxiety, maternal control behavior, and maternal and child external locus of control, and child anxiety. The full hypothesized model fit the data well (χ^2 (3)=2.94, p=0.40, RMSEA=0, SRMR= 0.04, CFI=1.0). Below, results related to each hypothesized meditational analysis are presented.

1. The association between maternal anxiety and child anxiety would be mediated by (a) maternal control behavior, (b) maternal external locus of control, and (c) child external locus of control. Mediational analyses were not conducted for either maternal factor because correlational analyses indicated that maternal anxiety was not associated with maternal control behavioral and that maternal external locus of control was not associated with child anxiety.

   A mediational analysis was conducted for child external locus of control. Path coefficients with t values greater than or equal to 2 indicate significant associations between variables. Maternal anxiety predicted child anxiety (B=0.04, SE=0.02, t=2.50, p=0.01) and child external locus of control (B=0.16, SE=0.06, t=2.55, p=0.01) (see Fig. 1). Additionally, child external locus of control predicted child anxiety, (B=0.09, SE=0.04, t=2.41, p=0.02). The direct effect of maternal anxiety on child anxiety was 0.04 (CI$_{95\%}$ of 0.009 to 0.070) and specific indirect effect of maternal anxiety on child anxiety was 0.014 (CI$_{95\%}$ of 0.001 to 0.035).

2. The association between maternal factors (i.e., control behavior and external locus of control) and child anxiety would be mediated by child external locus of control. Due to the lack of association between maternal external locus of control and child anxiety, a mediation effect was tested for only maternal control behavior. Maternal control behavior predicted child anxiety (B=0.04, SE=0.02, t=2.05, p=0.04) and child external locus of control (B=0.17, SE=0.07, t=2.29, p=0.02) (see Fig. 1). Additionally, child external locus of control predicted child anxiety (B=0.09, SE=0.04, t=2.41, p=0.02). The direct effect of maternal control behavior on child anxiety was 0.04 (CI$_{95\%}$ of 0.002 to 0.082) and the specific indirect effect of maternal control behavior on child anxiety was 0.014 (CI$_{95\%}$ of 0.002 to 0.04).

Discussion

The purpose of this study was to test and expand the components of one model of child anxiety (i.e., Chorpita and Barlow 1998). This model included maternal anxiety, a specific subdimension of parental control behavior (i.e., low parental autonomy granting), and cognitive factors (i.e., maternal and child external locus of control). Overall, our model of child anxiety fit the data well. We hypothesized that the association between maternal anxiety and child anxiety would be mediated by (a) maternal control behavior, (b) maternal external locus of control, and (c) child external locus of control. We also hypothesized that the association between maternal factors (i.e., control behavior and external locus of control) and child anxiety would be mediated by child external locus of control. Overall, findings revealed that child external locus of control mediated the relation between maternal and child anxiety and between maternal control behavior and child anxiety. Each of these findings, along with results related to each hypothesis, is discussed below.

Mediators of the Association between Maternal and Child Anxiety

Child external locus of control—Consistent with our hypothesis, the results indicated that child external locus of control partially mediated the association between maternal and child anxiety; thus, maternal anxiety appears related to a child's perceptions that he or she cannot control feelings of fear/anxiety (i.e., anxiety-specific external locus of control). Children who perceive themselves as having diminished control over anxiety-related events are more likely to experience elevated levels of anxiety. This finding is consistent with at least one theoretical model (i.e., Chorpita and Barlow 1998) and a growing body of empirical research highlighting the importance of child external locus of control as a pathway to child anxiety symptomatology (e.g., Ballash et al. 2006b; Chorpita et al. 1998; Ginsburg et al. 2004b).

Maternal control behavior—Contrary to our hypothesis, mothers who reported higher, compared to lower, levels of anxiety did not engage in more intrusive, restrictive, or controlling behaviors. This finding contradicts a common perception that parental anxiety results in overcontrolling parenting behaviors that puts children at risk for child anxiety. It is consistent with the work of Manassis and Bradley (1994) and subsequent research (e.g., Ginsburg et al. 2004a; Moore et al. 2004) that suggests maternal control behavior may be more strongly associated with child anxiety than with maternal anxiety. In the current study, children did not have clinical levels of anxiety, which may also explain the absence of a relation between maternal anxiety and maternal behavior.

Consistent with theory (i.e., Chorpita and Barlow 1998), research (e.g., Ballash et al. 2006b; Chorpita et al. 1998; Ginsburg et al. 2004a), and our hypothesis, maternal control behavior was associated with child anxiety (and child external locus of control, as discussed with findings from the second hypothesis below). Children of mothers who demonstrate controlling behaviors exhibit greater anxiety symptomatology than do children whose mothers encourage autonomy. Behaviors that inhibit a child's sense of independence may increase child anxiety by teaching a child that there is a constant threat in the environment that the child cannot manage without assistance and by limiting opportunities for the child to develop the skills necessary to master the environment (Chorpita and Barlow 1998; Ginsburg and Schlossberg 2002; Rapee 1997).

Maternal external locus of control—We hypothesized that anxious mothers would report cognitions regarding their inability to control outcomes in the environment (i.e., external locus of control) and that these thoughts would be related to higher levels of child anxiety. Our hypothesis was partially supported; mothers who reported higher levels of

anxiety also endorsed more beliefs that external forces are responsible for things that happen within the family. However, contrary to our hypotheses, maternal external locus of control was not associated with child anxiety. The absence of an association between maternal locus of control and child anxiety may reflect the true absence of a relationship, suggesting that parent behaviors, rather than cognitions, play a larger role in the development of child anxiety. An alternative explanation is that methodological factors may have weakened the association. For example, the specific measure of locus of control used in this study may not have been sufficient to fully capture this construct. Reliance on a community sample of families with children with subclinical levels of anxiety also may have weakened the association between these variables. One meta-analysis found that effect sizes of parenting behaviors on child anxiety tend to be smaller in nonclinical samples (McLeod et al. 2007), but it is not clear if the same holds true for parental cognitions. Future research should examine the effects of maternal external locus of control on child anxiety in a clinical sample.

Maternal external locus of control was also unrelated to maternal control behaviors. It may be that external locus of control is related to other anxiety-promoting parenting behaviors not examined in the study, such as withdrawal, as parents relinquish all attempts to control outcomes. Another possibility is that maternal external locus of control is unrelated to maternal behaviors, but that other maternal cognitions, such as parental efficacy, are more closely related to behavior. Future research on parental behavior should continue to include cognitive factors to more fully elucidate the model.

Child External Locus of Control as a Mediator between Maternal Factors and Child Anxiety

Maternal Control Behavior—Our second set of hypotheses examined the role of child external locus as a potential mediator of the associations between the two maternal factors (i.e., control behavior and external locus of control) and child anxiety. Consistent with theory (Chorpita and Barlow 1998) and research (Ballash et al. 2006b; Chorpita et al. 1998), we found that child external locus of control mediated the relationship between maternal control behavior and child anxiety, suggesting that as mothers engage in behavior that does not encourage independence, children's perceptions regarding their ability to control anxiety-specific symptoms and outcomes diminishes and increases their vulnerability for symptoms of anxiety.

Maternal External Locus of Control—We did not find evidence of an association between maternal and child external locus of control. The absence of a relation between maternal and child cognitions suggests that maternal external locus of control may not be as apparent to children as are maternal control behaviors, making the latter construct more salient in the development of child anxiety. Additionally, it may be that global locus of control is not as relevant to child anxiety as anxiety-specific locus of control. Previous research (e.g., Ginsburg et al. 2004b; Rapee et al. 1996) has demonstrated that the effect of locus of control on anxiety may be domain-specific; thus, thoughts regarding control specific to anxiety-related situations may be more strongly associated with anxiety than are general perceptions of control. In the present study, the use of a general measure of maternal external locus of control may have weakened the association between maternal locus of control and child anxiety. Future research should examine the effects of maternal external locus of control on child locus of control in a clinical sample and utilize measures tapping similar locus of control domains (e.g., general or anxiety-specific) for mothers and children.

Limitations

Similar to other studies examining the associations between parenting and child anxiety that employ cross-sectional designs, our study is correlational and therefore cannot provide

evidence of causal associations. Instead, our study provides a snapshot of the relationships among a specified set of variables and these relationships may differ across time and samples. There may be biases inherent in cross-sectional studies such as this one, including recall bias or reporter bias, which might be reduced within the context of a longitudinal design. Additionally, a longitudinal design using a similar sample would allow for stronger conclusions to be drawn regarding the effects of parenting and cognitions on symptoms of child anxiety. Moreover, the replication of this study using a clinical pediatric population could help determine the extent to which these findings reflect associations among variables related to child anxiety disorders. At the same time, this cross-sectional study provides a method by which to propose and preliminarily examine hypotheses upon which future studies can build.

Related, although our model reflects an extension of previous research and is grounded in theory about cognitive vulnerabilities for anxiety, it is simply one model of the associations among these variables. It is possible that another model including these variables in a different order would similarly fit the data. In other words, we proposed a theoretically-justified model, but because our model uses correlational data, caution must be used when interpreting the results so as to not infer causation. Using our data, we cannot determine whether maternal control behavior leads to child anxiety symptoms or whether child anxiety elicits certain types of controlling parenting behaviors, as has been suggested (Parker 1983). Similarly, we cannot determine whether child external locus of control truly precedes child anxiety or whether the reverse may be true. It is likely that there is a reciprocal influence among these variables. Replication of these analyses within the context of a longitudinal study would be informative and could include the examination of an alternative model that tests these constructs in a different order.

Although the inclusion of multiple respondents bolsters the validity of the data, there is the possibility that reporter bias artificially inflated the findings because all of our measures involved mono-method self-report. Because this study was conducted within the context of a larger child anxiety prevention study, there exists the possibility that questionnaire reports were biased by maternal anxiety (by the sample of anxious mothers). Anxious mothers may have overreported their own distress or underreported their child's anxiety in order to meet study criteria, thereby biasing our results. Reporter bias may be particularly relevant to the association among maternal control behavior, child external locus of control, and child anxiety, as each involved child-report. Combining mother and child reports of child anxiety, rather than using an independent and objective measure of child anxiety, may cause concern because maternal reports may be influenced by factors other than child anxiety (e.g., their own anxiety). Reliance on children's reports alone of their own anxiety would have raised concerns due to the underreporting of symptoms common to anxious youth (Pina et al. 2001; Jensen et al. 1993). Children, particularly those at the low end of the age range, may have limited experience with the concepts tapped by the questionnaires as well as completing questionnaires; thus, their self-evaluation may not be accurate. Certainly, these findings could be bolstered by future research using a multimethod design involving questionnaires and behavioral observation data.

Finally, characteristics of our sample reflect a limitation to our study. Our sample was relatively small and although the subject to parameter ratio in our path analysis was adequate (Bentler and Chou 1988), there may be concerns regarding our power to detect significant associations. However, our use of bootstrapping procedures increases the confidence in our results. Another issue is that the sample primarily consisted of two-parent upper middle class families of Caucasian descent; thus, our findings should be replicated in a more diverse sample to determine the generalizability of the results. Additionally, data used in the present study were obtained from a larger study which required the participation

of only one anxious parent; thus, mothers were overrepresented in our sample and we excluded the few anxious fathers for whom we had data based on a number of considerations. First, it would have been difficult to examine parent gender differences given the small number of fathers. Second, mothers are more likely than fathers to be the primary caregiver; thus exposure to maternal parenting behavior is likely to have a greater impact on the child. Third, the literature on anxiety promoting parenting behaviors is largely based on mothers; thus it is unclear whether anxious fathers engage in the same patterns of parenting. Future studies should strive to include fathers to examine parenting behaviors and cognitions. The final sample issue concerns the restricted age range of the children (78.6% between the ages of 7–10). Due to the restricted range, we were unable to examine the model using a developmental framework. Both theory (Chorpita and Barlow 1998) and research (e.g., Ballash et al. 2006b; Hagekull et al. 2001) suggest that the associations among parental control, child cognitions, and child anxiety may differ depending on the child's age. Examining these associations using a larger sample with a wider age range of children, ideally in a longitudinal design, could provide important information regarding the etiology of child anxiety.

Conclusion

This study tested components of a model of child anxiety and examined the mediational roles of maternal control behavior, maternal external locus of control, and child external locus of control on the association between maternal anxiety and child anxiety. Findings from the present study suggest that the development of symptoms of child anxiety is equifinal in nature, such that there are multiple pathways of vulnerability. First, there is a direct link between maternal and child anxiety, perhaps explained by genetic or biological factors. Second, maternal anxiety is also related to a child's external locus of control, such that offspring of anxious parents are more likely to perceive that they do not have control over anxiety-related situations. It may be the case that maternal anxiety, perhaps through parental modeling, increases the risk for a child to develop external locus of control. External locus of control may be inadvertently reinforced by anxious parents perhaps via modeling, behavioral withdrawal, or positive reinforcement when the child exhibits anxiety, thereby increasing the risk of child anxiety. Third, maternal control behavior also diminishes a child's sense of control over anxiety-related events, perhaps by restricting opportunities for mastery of the environment or instilling a sense of dependence. Diminished control then increases psychological vulnerability for anxiety. The finding that child external locus of control is common to the latter two pathways of vulnerability highlights the importance of this factor in the development of anxiety symptoms and provides an additional explanation of how maternal anxiety is transmitted to children.

Findings from this study suggest that parenting behaviors (e.g., maternal control behavior) and child cognitions (e.g., external locus of control) are potential targets for intervention within family-based interventions for child anxiety. For example, cognitive strategies targeting child external locus of control could be an effective component of prevention and early intervention programs for children of anxious parents to limit the risk for future anxiety. Alternatively, psychoeducation and related strategies aimed at reducing maternal anxiety and control has potential benefits for the prevention and reduction of child anxiety (Ginsburg 2009) and could be paired with cognitive strategies delivered to directly to children.

Acknowledgments

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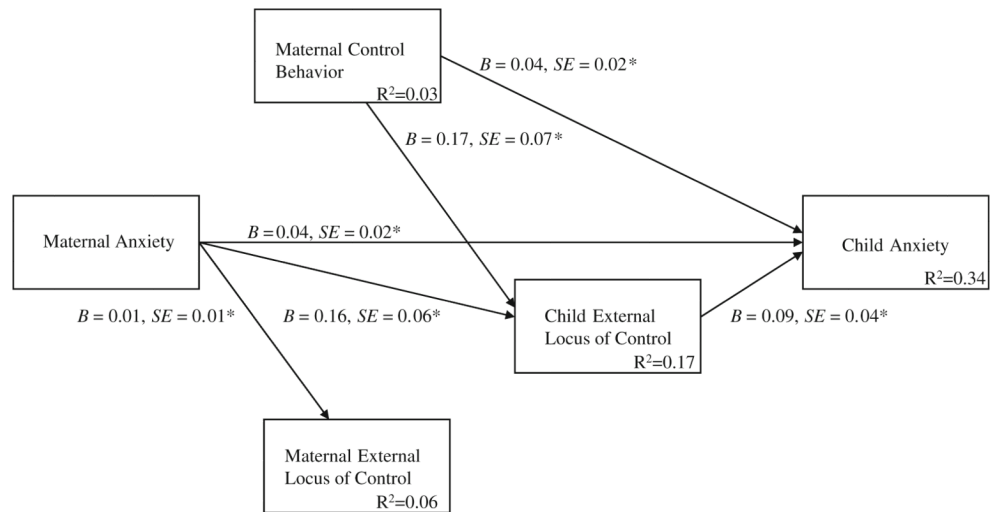
Fig. 1.
Empirical model: Influence of maternal control behavior, maternal external locus of control, and child external locus of control on the association between maternal and child anxiety.
Note. Solid lines represent significant associations, *p<0.05

Table 1

Demographic Characteristics of Families of Anxious and Healthy Mothers

	Anxious Mothers (*n*=38)	Healthy Mothers (*n*=37)	Difference Between Groups
Mother's Age[1]	*M*=40.55, *SD*=5.27	*M*=39.32, *SD*=6.26	$t_{(73)}$=0.92, *p*=0.36
Marital Status[2]	0.89 (32) Married	0.78 (29) Married	χ^2 (4, *N*=75)=6.04, *p*=0.23
Mother's Education[2]	0.70 (30) College &/or Advanced Degree	0.70 (26) College &/or Advanced Degree	χ^2 (5, *N*=75)=6.80, *p*=0.24
Family Income[2]	0.66 (25) Over 80,000	0.51 (19) Over 80,000	χ^2 (8, *N*=75)=6.12, *p*=0.63
Child's Age[1]	*M*=8.86, *SD*=1.86	*M*=9.20, *SD*=1.48	$t_{(73)}$=−0.89, *p* =0.36
Child's Gender[2]	0.55 (21) Male	0.41 (15) Male	χ^2 (1, *N*=75)=1.63, *p*=0.20
Child's Ethnicity[2]	0.92 (35) Caucasian	0.67 (24) Caucasian	χ^2 (3, *N*=73)=9.40, *p*=0.02 *

[1] Results are presented in means and standard deviations.

[2] Results presented in percents, number of respondents indicated in parentheses.

*
p<0.05,

**
p<0.01.

Table 2

Means and Standard Deviations for Anxiety, Behavior, and Locus of Control Variables

Variable	Total Sample (*N*=75)	Anxious Mothers (*n*=38)	Healthy Mothers (*n*=37)	*t*
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	
Maternal Anxiety	51.11 (10.96)	59.26 (8.26)	42.73 (5.88)	9.96[**]
Maternal Control Behavior	51.57 (8.53)	51.06 (8.94)	52.09 (8.20)	0.50
Maternal External Locus of Control	1.59 (0.45)	1.66 (0.47)	1.52 (0.43)	1.34
Child External Locus of Control	10.74 (5.46)	11.51 (5.83)	9.82 (4.93)	1.26
Child Anxiety	0.04 (1.51)	0.71 (1.51)	−0.65 (1.16)	4.36[**]

[**]
p<0.01

Table 3

Correlations among Anxiety, Behavior, and Locus of Control Variables

	(1)	(2)	(3)	(4)
(1) Maternal Anxiety				
(2) Maternal Control Behavior	−0.02			
(3) Maternal External Locus of Control	0.25*	0.02		
(4) Child External Locus of Control	0.34**	0.29*	0.10	
(5) Child Anxiety	0.39**	0.33**	0.13	0.48**

*
$p < 0.05$

**
$p < 0.01$