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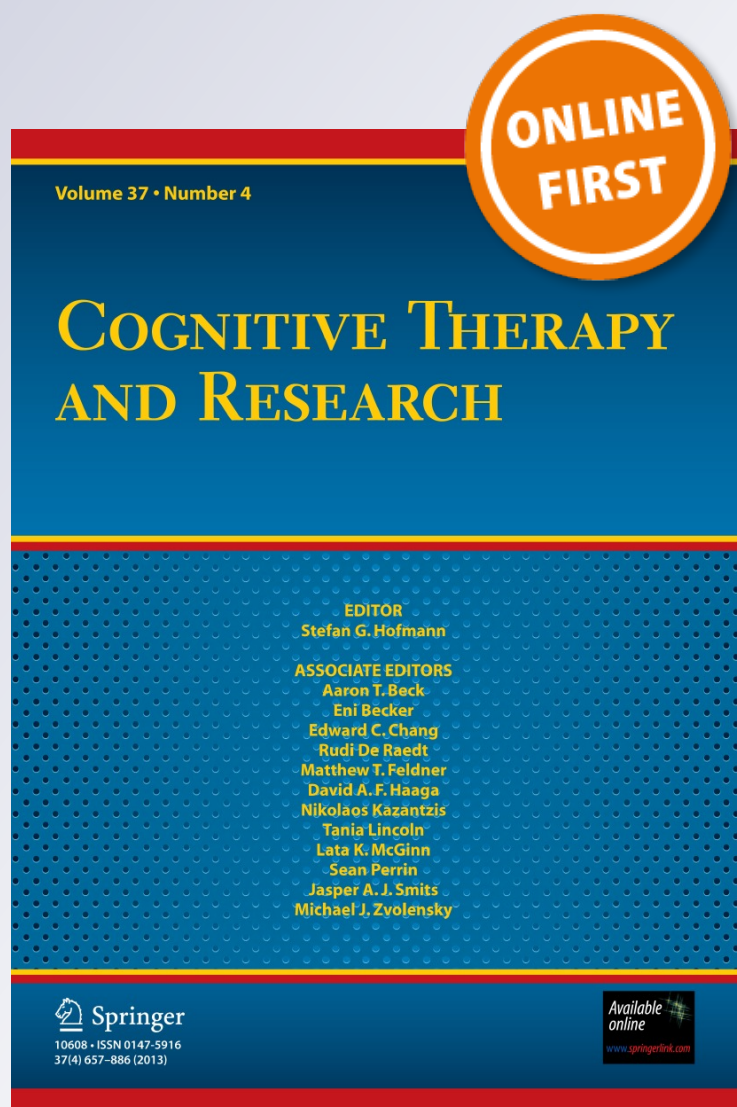
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# Perceived Psychological Control and Anxiety in Early Adolescents: The Mediating Role of Attributional Style

Jessica L. Schleider · Clorinda E. Vélez ·  
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**Abstract** Research indicates that perceived parental control is a risk factor for anxiety in youth, but mechanisms underlying this connection remain under-examined. This study examined whether hopeless attributional style mediates this relationship, as well as whether this relationship is moderated by gender, in early adolescents ( $N = 116$ , ages 10–14). We assessed two hypotheses: (1) that hopeless attributional style would mediate the relationship between perceived maternal psychological control and anxiety symptoms across 1 year, and (2) that this pathway would be stronger for girls than for boys. This study used a three-wave, prospective longitudinal design. Hopelessness was a significant mediator; early adolescents who perceived high rates of maternal psychological control tended to develop a more hopeless attributional style, which in turn predicted increases in anxiety. This effect was not moderated by gender. We discuss implications for treating and preventing anxiety in youth, specifically the need for interventions to address children's hopeless attributions and perceptions of parents' behaviors.

**Keywords** Anxiety · Adolescence · Psychological control · Attributional style

## Introduction

Anxiety disorders are among the most common mental health issues in youth, affecting 8–15 % of children and adolescents each year (Muris and Steerneman 2001; Puskar et al. 2009). Research has emphasized the impact of certain parenting practices on the development of these disorders in youth (Chorpita and Barlow 1998; McGinn et al. 2010; McLeod et al. 2007; Rapee 2001). Especially correlated with youth anxiety are parenting styles marked by high psychological control, characterized by coercive, passive-aggressive, intrusive strategies to manipulate children's thoughts, feelings, and activities (Barber 1996; De Man 1986). Theoretical models have hypothesized that high parental psychological control may prevent children from acting independently, reduce children's abilities to navigate new environments on their own, and increase feelings of hypervigilance and fear while decreasing senses of mastery (Chorpita and Barlow 1998; Rapee 2001). Etiological models of youth anxiety also suggest that negative events, such as psychologically controlling parenting, lead to later anxiety through the formation of cognitive styles characterized by a lowered perception of control over events and outcomes (Chorpita and Barlow 1998; Chorpita et al. 1998; McGinn et al. 2010). Few studies have examined these relationships using a longitudinal design or examined the mediating impact of other cognitive styles, such as a pessimistic attributional style, that have also been linked to anxiety (Alloy et al. 1990). By exploring whether other cognitive styles might explain the relations between parenting styles and anxiety, studies may inform efforts to treat and prevent anxiety in youth.

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## Psychological Control and Child Anxiety

Parental psychological control is linked to internalizing problems in youth. Cross-sectional work demonstrates that high parental psychological control is associated with low self-esteem, depressive symptoms, and anxiety symptoms in children and adolescents (Barber 1996; Litovsky and Dusek 1985; Nanda et al. 2012). Longitudinal research suggests that maternal overprotection (a parenting dimension related to psychological control) moderated links between children's inhibition with peers at age two and their social anxiety at age four (Rubin et al. 2002). That is, among socially inhibited 2-year-olds, children with mothers reporting higher levels of control tended to show greater social anxiety symptoms 2 years later, whereas those with mothers reporting less controlling behaviors did not show this tendency. Similarly, perceptions of high maternal psychological control have been found to predict increases in adolescents' anxiety over 6 months (Pedersen 1994). Conversely, some research suggests that parents' encouragement of children's autonomy may augment children's perceived mastery of their environment, leading to anxiety reduction (Chorpita and Barlow 1998; Zalta and Chambless 2011).

### Psychological Control and Child Anxiety: The Unexplored Role of Attributional Style

Some researchers have suggested that cognitive styles might mediate the relationship between parental psychological control and anxiety across childhood and adolescence (Chorpita and Barlow 1998). When children perceive their parents as highly controlling, they may come to believe that the world is a dangerous place and that they do not have the capacity to handle problems that may arise. Children who perceive their parents as highly controlling may come to view their worlds as unpredictable, leading to hypervigilance and fear (Schneewind 1995). Their heightened insecurity and worry may foster negative views of the world and the self, which may predict the emergence of anxiety symptoms (Ballash et al. 2006).

Research exploring locus of control supports this model. Locus of control is conceptualized as a continuum ranging from *internal* to *external*. Individuals with an internal locus of control view life events as predictable and manageable, while those with an external locus of control view life events as random and unpredictable. In adults, an external locus of control is linked to anxiety symptoms (Hoehn-Saric and McLeod 1985). For instance, in one study, adults experiencing catastrophic thoughts about a social encounter suffered social anxiety, in part, because they viewed their anxiety symptoms as beyond their control (Hofmann 2005).

Similarly, in youth populations, an external locus of control correlates with and predicts anxiety symptoms and disorders (Chandler et al. 1980; Davis and Phares 1969; Gordon et al. 1981). Cross-sectional research suggests that an external locus of control mediates the relationship between perceived parental control and anxiety (Chorpita et al. 1998) and between dysfunctional parenting in general and anxiety (McGinn et al. 2010) in children ages 6–15. Similarly, undergraduates who recalled parental over-involvement during childhood tended to feel less in control of their current lives; this feeling, in turn, was linked to higher anxiety (Ballash et al. 2006).

A less-explored cognitive factor that may relate to psychological control and anxiety in youth is attributional style, defined as the habitual ways individuals account for events in their lives (Peterson and Steen 2002). These accounts vary across three domains: internal versus external (viewing events as caused by the self or by external factors), stable versus unstable (viewing causes of events as unchangeable or changeable), and global versus specific (viewing causes of events as generalizable or isolated instances) (Abramson et al. 1978). Internal, stable, and global attributions for the causes of negative events have been shown to have important implications for youths' mental health problems. For example, the youth attributional style literature outlines a cognitive model of the development of depression in which the combination of internal, stable, and global attributions for negative events (or a "pessimistic attributional style") mediates the relationships between negative life experiences, such as highly controlling parenting, and depression (Garber and Flynn 2001; Nolen-Hoeksema et al. 1992; Turner and Cole 1994). Additional work in youth attributional style has suggested that it is the stable and global attributions in particular that are especially strong predictors of internalizing problems and disorders in youth (Abela 2001; Abela and Sarin 2002). For instance, a child who habitually views negative events as having stable and global causes (i.e., who has a "hopeless" attributional style) may view a fight with her parent as resulting from an unchangeable difficulty that broadly affects her life. These attributions may be internal or external (e.g., "I'm a bad daughter"; "My parents don't care about me"). This negative bias towards evaluating life events may eventually exacerbate internalizing symptoms and disorders.

While much of this work has focused on depression, attributional style in general—and hopeless attributional style, in particular—may also influence the emergence of anxiety. Although focused on *expectations* for the future rather than *explanations* for negative events that have already occurred, Alloy et al.' (1990) helplessness-hopelessness theory of anxiety and depression provides a relevant framework for the role of attributional style in the

development of anxiety. Alloy et al. (1990) highlight two key expectations that are believed to be closely associated with anxiety: a sense of a lack of control over life events, and a sense of uncertainty and unpredictability about future occurrences of these events. The first of these factors—uncontrollability, or a sense of low control over life events—is described as a key risk factor for both anxiety and depression, and is directly related to hopeless attributional style. When events are perceived as uncontrollable, Alloy and colleagues state that individuals are likely to experience a heightened state of arousal or anxiety. By extension, habitually viewing negative events as due to stable and global and thus uncontrollable causes may be a key risk factor for the development or exacerbation of anxiety problems in youth.

Some studies examining parenting styles, attributional style, and anxiety in youth support this possibility. Although there are theoretical and empirical reasons to believe that the hopeless attributional style is especially predictive of internalizing problems, the majority of past studies have examined pessimistic attributional style (which incorporates hopeless attributional style along with the tendency to make internal attributions). Attributional style has shown relations with anxiety in adults (Bell-Dolan and Wessler 1994; Luten et al. 1997), with some evidence suggesting similar relationships among youth. A longitudinal, prospective study found that a pessimistic attributional style predicted fear in children aged 8 through 16 (Ciarrochi et al. 2007). Among correlational studies, some mixed evidence has emerged. While Chorpita et al. (1998) found no significant correlation between a pessimistic attributional style and clinical anxiety in youth, Bell-Dolan and Last (1990) found that both trait anxiety and anxiety disorders in children were significantly correlated with a pessimistic attributional style. Specifically, children with anxiety disorders were more likely to generate internal, global, and stable attributions for negative events than nonanxious children. Similarly, Hilsman and Garber (1995) found that a pessimistic attributional style was associated with more negative reactions to a “bad” report card among fifth and sixth graders.

Prior research has also shown a relationship between negative parenting styles and children’s pessimistic attributional style. A longitudinal study found that mothers’ self-reported anger towards their child, as well as observed anger in mothers’ feedback to their child’s failures, predicted children’s pessimistic attributional styles in early adolescence (Mezulis et al. 2006). Separately, a cross-sectional study suggested strong correlations between adolescents’ perceptions of punitive parenting and pessimistic attributional style (Lau et al. 2006). Despite this work, only one study has explored pessimistic attributional style as a mediator between parenting styles and anxiety,

though research suggests links between each of these variables (Chorpita et al. 1998).

Together, these findings suggest that perceived parental over-control may lead children to develop attributional styles that precipitate anxiety. However, extant literature has several limitations. First, many studies exploring relations between these variables rely on retrospective reports of parents’ behaviors. Considering the biases associated with retrospective reporting (e.g. Bögels and Brechman-Toussaint 2006), prospective research is needed to identify key factors in the development of anxiety in youth. Second, many models of anxiety vulnerability—even those testing meditational models—use a single time-point for analyses (Ballash et al. 2006; Chorpita and Barlow 1998), and researchers have called for longitudinal studies of such models (McLeod et al. 2007). Finally, it is important to explore relations between psychological control and anxiety in early adolescents. As youth move from late childhood to early adolescence, their self-conceptions may grow more generalized, and their cognitive styles, more stable (Harter 1986). Thus, more research is needed to understand relations between perceived psychological control, cognitive styles, and anxiety during this key developmental period. To address these gaps, this study examined attributional style as a mediator between parental psychological control and anxiety in early adolescents using a longitudinal design.

### Addressing Gender in the “Parental Control → Attributional Style → Anxiety” Pathway

Given higher rates of anxiety disorders in girls than boys (Lewinsohn et al. 1998; McLean and Anderson 2009), it is important to address the potential role of gender in etiological models of anxiety in youth. For instance, the proposed “parental control → attributional style → anxiety” pathway might be more salient for girls than for boys, though research has not explored gender differences in this pathway among youth.

First, controlling parenting may be more strongly linked to anxiety in girls than in boys, and researchers theorize that this pattern may partially account for gender differences in anxiety (Axinn et al. 2011; Pomerantz and Rubel 1998; Ruble et al. 1993). Further, some research suggests girls may be especially sensitive to parental expectations, developing pessimistic attributional styles more readily than boys in response to parents’ expectations (Zalta and Chambless 2011). However, research has not assessed whether gender moderates relations between parental control, attributional style, and anxiety. Such studies may suggest gender-specific pathways for the development of anxiety in youth, which may help explain girls’ relatively high rates of anxiety symptoms and disorders.

## Overview of Present Research

Given the connection between parental psychological control and anxiety in youth, there is a need to understand cognitive mechanisms underlying this relationship. Accordingly, we explored links between perceptions of mothers' psychological control, attributional style, and anxiety symptoms among early adolescents across 1 year. We also explored whether these relations differed according to gender. Building on models of anxiety vulnerability (e.g. Ballash et al. 2006; Chorpita et al. 1998), we first hypothesized that maternal psychological control would predict more hopeless attributional styles (the tendency to attribute negative events to stable and global factors), which in turn would predict greater anxiety in youth. We focus on hopeless (stable and global) attributional style rather than pessimistic attributional style (which also includes a tendency to make internal attributions) because recent theoretical and empirical work suggest that the stable and global dimensions of attributional style are most predictive of internalizing symptoms (Abela 2001; Abela and Sarin 2002). Second, we predicted that gender would moderate the strength of this pathway, such that mediation would be stronger for girls than for boys.

## Methods

### Participants

We drew data from the control group of an effectiveness trial of the Penn Resiliency Program (PRP), a school-based program designed to promote resilience and prevent depression in middle school students. The larger PRP study and the present study involving secondary data analyses were approved by the University of Pennsylvania's Institutional Review Board. Parents of students aged 10–14 from five middle schools in a suburban metropolitan area in the northeastern United States initially received a mailing regarding participation. Students for whom we had parental consent and student assent completed screenings for depressive symptoms using the Children's Depression Inventory (CDI; Kovacs 2001). Students demonstrating elevated levels of depressive symptoms were offered places in the study first; the remaining students were then offered places until all slots were filled. Symptom levels ranged from no symptoms to very high levels of symptoms. Details regarding recruitment procedures and a description of the full PRP sample are provided elsewhere (Gillham et al. 2012). In the full PRP sample, four hundred and twelve adolescents attending middle schools in the Philadelphia area completed baseline assessments. Following baseline assessments, two thirds of participating children were randomly assigned to one of two intervention

conditions, with the remaining third ( $n = 129$ ) serving as a control group.

In the present study, analyses include children from the PRP control group only. No additional inclusion or exclusion criteria were used for this sample beyond those used for the larger PRP study. This enabled us to assess the proposed model across three time points in an untreated, community sample. Two participants were excluded from analyses due to missing data on predictor variables, and eleven were excluded due to missing data on all dependent variables; data from the remaining 116 students were used in analyses. Data were available for all 116 of these students at baseline (Time 1) and the first follow-up point (Time 2). At the final follow-up point (Time 3), data were available for 110 of the students. At baseline (Time 1), these students were in grades 6 through 8 (48.3 % in sixth; 28.4 % in seventh; 23.3 % in eighth). Fifty-one percent were female; 77.6 % were Caucasian, 12.9 % African American, 0.9 % Latino/a, 4.3 % Asian American, and 4.3 % identified as Other. Among parents, 60 % of mothers and 50 % of fathers reported obtaining a bachelor's degree or higher. Sixty-four percent of parents were married at baseline assessment, 12.9 % divorced, 6.9 % separated, 5.2 % never married, and 1.7 % listed marital status as "other." At baseline, the average CDI score was 11.12 ( $SD = 7.66$ , range 0–39), and their average score on the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds and Richmond 1997) was 12.05 ( $SD = 1.02$ , range 0–28). These mean scores correspond approximately to the 62nd to 73rd percentile for the CDI and the 49th to 73rd percentile for the RCMAS, based on the standardization samples (Kovacs 2001; Reynolds and Richmond 1985). Thus, CDI and RCMAS scores for our sample were slightly higher than average, although still well within one standard deviation of the standardization sample means. Participants' scores covered the full range from no symptoms to high levels of symptoms. While no standardized norms are available for the measures used for hopeless attributional style or perceived psychological control, scores on these measures also covered the full possible ranges.

All students completed assessments at baseline and every 6–12 months thereafter. Participants were followed for 3 years. This paper uses control group data from the initial three measurement points conducted 6 months apart. These assessments are referred to as Time 1, Time 2, and Time 3 (or T1, T2, and T3) within.

### Measures

*The Children's Report of Parenting Behavior Inventory (CRPBI; Schaefer 1965)*

Perceived maternal psychological control was measured using child report of the Psychological Control versus

Autonomy subscale of the short version of the CRPBI (Schludermann and Schludermann 1988). Participants are asked to respond to 10 questions about their mothers using a 3-point Likert scale, where respondents rate each item as being “like” (3), “somewhat like” (2), or “not like” (1) the mother. Items include, “[My mother] is always telling me how I should behave” and “[My mother] feels hurt when I don’t follow her advice.” Higher total scores indicate that children view their mothers are more psychologically controlling. The short version of the CRPBI Psychological Control versus Autonomy subscale has demonstrated good internal consistency and moderate to high convergent validity with the Parental Bonding Instrument Overprotection scale and the full CRPBI Psychological Control versus Autonomy scale (Safford et al. 2007).

*The Children’s Attributional Style Questionnaire (CASQ; Seligman et al. 1984)*

Children’s causal attributions for negative events were assessed with the 24-item negative events composite of the CASQ. Each CASQ item describes a hypothetical event (e.g., “You break a glass”) and asks respondents to choose between two explanations for these events. Resulting subscales reflect internal versus external attributions, stable versus unstable attributions, and global versus specific attributions for negative events. For present analyses, a hopelessness composite score was used, which is the sum of the stable and global subscales for negative events. We focus on children’s responses to negative events because there is some evidence that attributional style for negative events alone is a more valid indicator of internalizing psychopathology than attributional style for negative and positive events combined (Peterson and Seligman 1984). Higher scores on the hopelessness composite reflect more hopeless (stable and global) attributions for negative events. This composite score has been shown to predict internalizing symptoms and disorders particularly well in youth, and has obtained alphas greater than 0.5 in previous studies (Abela 2001; Abela and Sarin 2002). The CASQ has been widely used in research on attributional style and internalizing disorders in youth (e.g., Gillham et al. 1995; Jaycox et al. 1994; Kim-Spoon et al. 2012). In previous research, the CASQ has demonstrated moderate to high test–retest reliability (Thompson et al. 1998).

*The Revised Children’s Manifest Anxiety Scale (Reynolds and Richmond 1997)*

The RCMAS assesses anxiety symptoms in youth. This child-reported measure contains 37 items: 28 anxiety-related items (e.g. “I often worry about something bad happening to me”; “Often I feel sick in my stomach”) and

9 “lie scale” items, which assess the sincerity of the child’s responses. Each item is assessed using a “yes/no” rating scale, and the measure contains an overall composite score, which was used for present analyses. Higher composite scores reflect higher levels of anxiety symptoms. The RCMAS has correlated highly with other measures of anxiety symptoms in children (Reynolds and Richmond 1997).

Analytical Procedure

*Correlations and t Tests*

Correlations were computed among T1, T2, and T3 perceived maternal psychological control, hopeless attributional style, and anxiety. To highlight gender differences, these correlations were conducted separately for boys and girls. *t* tests were also conducted to examine whether perceived maternal psychological control, hopeless attributional style, and anxiety differed by gender.

*Mediation Model*

Mediation was tested using a three-wave longitudinal design in which the assessment of the independent variable (maternal control) took place at T1, 6 months prior to assessment of the mediator variable (attributional style) at T2, and 12 months prior to assessment of the outcome variable (anxiety) at T3. The model controlled for T1 anxiety and T1 attributional style. According to guidelines outlined by MacKinnon, Krull, and Lockwood (2000), support for two sets of hypotheses is needed to establish mediational pathways: after controlling for the direct effect (*c*’ path), (1) the independent variable should predict the hypothesized mediator(s) (*a* path), and (2) the mediator(s) should predict the outcomes (*b* path). If both the *a* and *b* paths were fully or marginally significant (supporting the mediation hypothesis), we then tested the significance of the indirect mediated effect by using the bias-corrected bootstrapping procedure with Mplus Software (Version 6.0, Muthén and Muthén 1998–2010; see Efron and Tibshirani 1986; Manly 1997, for a description). If the resulting 95 % confidence interval for the mediated effect does not include zero, the mediated effect is considered significant. In their review of the most common tests of mediation, Fritz and MacKinnon (2007) report that this procedure provides a more powerful method of testing mediation than more traditional approaches, such as Baron and Kenny (1986). The MPlus feature for Full Information Maximum Likelihood Estimation with missing data (FIML) was used to account for missing scale scores. FIML procedures estimate the parameter values of interest using all available data.

Moderation of Mediation Pathway

To test whether mediation was stronger for girls than for boys, we first conducted a two-group analysis to test the mediational model simultaneously for boys and for girls. We tested two nested models: (1) a fully constrained model, in which all paths were constrained to be equal across the two genders, and (2) a partially constrained model, in which all but the three primary mediational paths were constrained to be equal across the two genders. We then conducted a Chi square difference test between the fully constrained and partially constrained models; a significant difference between the Chi square values for the two models would indicate that the mediational paths significantly differ for girls and boys.

Results

Descriptive Statistics and Correlations

Table 1 shows means, standard deviations, and correlations between all study variables. Tables 2 and 3 illustrate these values for girls and boys, respectively. Mean psychological

control, attributional style, and anxiety scores did not differ by gender. Many correlations were significant and in anticipated directions given prior literature on links between these variables. Most correlations were medium in size for girls and small to medium for boys. Notably, perceived maternal psychological control at T1 correlated with anxiety at T1 and T3 in girls, but not in boys. Attributional style at T1 and T2 also correlated with anxiety at T1 and T3 in girls only. We used Fisher *r*-to-*z* transformations to examine whether correlations differed significantly by gender. Significant gender differences emerged for the correlation between T1 anxiety and T2 attributional style ( $z = 2.43, p = .008$ ), as well as between T1 perceived psychological control and T1 anxiety ( $z = 2.41, p = .01$ ), T3 anxiety ( $z = 3.05, p = .001$ ), T1 attributional style ( $z = 2.45, p = .01$ ), and T2 attributional style ( $z = 2.18, p = .02$ ). All differences were in expected directions, with correlation coefficients stronger for girls than for boys.

Mediation Model

We tested whether T2 attributional style mediated the relation between T1 perceived maternal psychological control and T3 anxiety (see Fig. 1). The model for the

**Table 1** Means, standard deviations, and correlations for study variables

	Anxiety T1	Anxiety T3	Attr. style T1	Attr. style T2	Psych. control T1
Anxiety T1	–	.75**	.57**	.43**	.32**
Anxiety T3	–	–	.51**	.48**	.20**
Attr. style T1	–	–	–	.61**	.33**
Attr. style T2	–	–	–	–	.30**
Psych. control T1	–	–	–	–	–
Mean	12.05	10.94	4.87	4.75	17.46
SD	1.02	7.65	2.66	2.95	4.06
Range	.00–27.00	.00–28.00	1.00–13.00	.00–14.00	10.00–29.00

Attr. style = hopeless attributional style, Psych. control = perceived maternal psychological control

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

**Table 2** Correlations for all study variables—girls

	Anxiety T1	Anxiety T3	Attr. style T1	Attr. style T2	Psych. control T1
Anxiety T1	–	–	–	–	–
Anxiety T3	.74*	–	–	–	–
Attr. style T1	.61**	.47**	–	–	–
Attr. style T2	.56**	.56**	.67**	–	–
Psych. control T1	.48**	.41**	.46**	.44**	–
Mean (SD)	11.08 (7.71)	9.32 (7.40)	4.46 (2.75)	4.59 (2.95)	17.42 (3.89)
Range	.00–27.00	.00–28.00	1.00–13.00	.00–14.00	11.00–29.00

Attr. style = hopeless attributional style; Psych. control = perceived maternal psychological control. *t* tests of variable means by gender were not significant

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



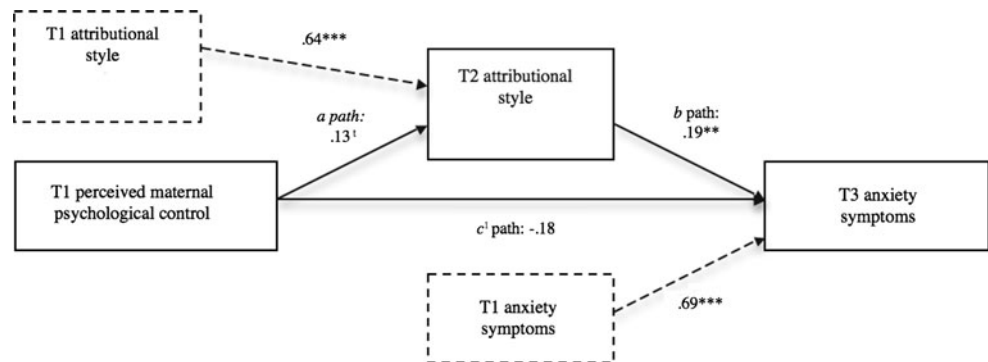
**Table 3** Correlations for all study variables—boys

	Anxiety T1	Anxiety T3	Attr. style T1	Attr. style T2	Psych. control T1
Anxiety T1	–	–	–	–	–
Anxiety T3	.76**	–	–	–	–
Attr. style T1	.57**	.43**	–	–	–
Attr. style T2	.30*	.41**	.54**	–	–
Psych. control T1	.20	.03	.17	.18	–
Mean (SD)	10.79 (7.83)	7.42 (7.98)	5.28 (2.44)	4.91 (2.94)	17.49 (4.21)
Range	.00–27.00	.00–28.0	1.00–10.00	.00–14.00	10.00–29.00

Attr. style = hopeless attributional style; Psych. control = perceived maternal psychological control. *t* tests of variable means by gender were not significant

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

**Fig. 1** Mediation model with standardized regression coefficients. †  $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$



proposed pathway provided acceptable fit to the data,  $\chi^2(2) = 4.58$ ,  $p = .10$ , CFI = .98, RMSEA = .11, SRMR = .02. T1 perceived psychological control marginally predicted T2 attributional style (*a* path), suggesting that children who perceived their mothers to exert more psychological control reported a more hopeless attributional style than their peers 6 months later ( $\beta = .13$ ,  $p = .096$ ). Further, T2 attributional style significantly predicted T3 anxiety (*b* path), indicating that a more hopeless attributional style predicted higher anxiety levels ( $\beta = .19$ ,  $p = .005$ ). The bias-corrected bootstrapping test of the mediational model also reached significance, 95 % CI: .001, .136, indicating that attributional style significantly mediated the relationship between perceived maternal psychological control and anxiety.

Given literature demonstrating depression's relations with each of the three primary study variables (i.e., psychological control, attributional style, and anxiety), the current mediational findings could reflect a model of depression, rather than anxiety. To address this concern, we tested an identical mediational model using depression in place of anxiety (i.e., T2 attributional style mediating the relation between T1 psychological control and T3 depression). Depression was measured at T1 and T3 using the Children's Depression Inventory (CDI; Kovacs 2001). CDI scores were skewed and kurtotic; a square root

transformation was thus used on all CDI scores. Inspection of the model fit and modification indices for the initial model indicated that the addition of a path from T1 depression to T2 attributional style would significantly improve model fit,  $\chi^2(1) = 5.44$ ,  $p = .01$ . The addition of this path led to good model fit,  $\chi^2(1) = 1.532$ ,  $p = .22$ , CFI = 1.00, RMSEA = .07, SRMR = .01. T1 perceived psychological control did not significantly predict T2 attributional style (*a* path), ( $\beta = .09$ ,  $p = .24$ ). T2 attributional style significantly predicted T3 depression (*b* path), indicating that a more hopeless attributional style predicted higher depression levels ( $\beta = .29$ ,  $p < .001$ ). The bias-corrected bootstrapping test of the mediational model did not reach significance, 95 % CI:  $-.004$ , .029, indicating that attributional style did not significantly mediate the relationship between maternal psychological control and depression. The results of these analyses suggest that depression does not account for the parental control → attributional style → anxiety pathway that we observed.

Moderation of Mediational Pathway by Gender

Analyses revealed that the fully constrained model fit the data well,  $\chi^2(9, 116) = 7.49$ ,  $p = .59$ , CFI = .99, RMSEA = .00, SRMR = .04. The partially constrained

model (i.e., the model permitting the primary mediation paths to differ by gender) also fit the data well,  $\chi^2(6, 116) = 5.58$ ,  $p = .47$ , CFI = .99, RMSEA = .00, SRMR = .03. The Chi square difference test between the fully and partially constrained models was non-significant,  $\chi^2(3) = 1.90$ ,  $p = .59$ , indicating that the partially constrained model did not fit the data significantly better than the fully constrained model. Thus, findings suggest that the mediational model did not differ significantly for boys and girls.

## Discussion

We tested two main hypotheses: first, that hopeless attributional style would mediate links between early adolescents' perceptions of maternal psychological control and anxiety symptoms, and second, that gender would moderate the strength of this pathway. Our findings supported the first hypothesis but not the second. We found that perceptions of parental psychological control predicted hopeless attributions, which, in turn, predicted symptoms of anxiety. This mediational pathway did not differ by gender.

These results build on a large body of research regarding child-rearing practices and anxiety in youth, which has emphasized links between perceptions of parental control and anxiety disorders (See McLeod et al. 2007, for a review). The proposed model offers one mechanism by which this link might emerge. Early adolescents who view their mothers as psychologically controlling might come to habitually view the causes of adverse situations as stable (unchanging) and global (applying to many aspects of their lives). Psychologically controlling parents are often harsh, intrusive, and guilt inducing. Chronic exposure to these parenting behaviors may shape children's beliefs about not only their parents, but about the broader world around them. For instance, these children may develop beliefs such as "I am not good enough" or "adults are critical and mean." These stable, global beliefs about the causes of negative events may affect children's expectations for the future. For instance, children may come to view the world as dangerous, anticipating more negative events in the future; further, they may doubt their ability to prevent these events or to cope with them once they occur. As in Alloy and colleagues' hopelessness–helplessness theory (1990), viewing impending negative events as unavoidable and potentially uncontrollable may facilitate the development and maintenance of anxiety.

This model fits with prior research suggesting that cognitive styles leading to a lowered sense of control mediate the relationship between parenting styles and anxiety in youth (Chorpita et al. 1998; McGinn et al. 2010). Our use of longitudinal, prospective data offers strong evidence for the

role of cognitive factors such as attributional style in the link between maternal psychological control and child anxiety. Further, our use of an early adolescent sample supports the model's relevance during a salient developmental period, when cognitive factors such as attributional style begin to stabilize (Bell-Dolan and Wessler 1994).

Further, while evidence has supported a relationship between attributional style and depression (e.g. Mezulis et al. 2006; Nolen-Hoeksema et al. 1992; Turner and Cole 1994), the present study is among few to assess links between attributional style and anxiety in a youth population (Chorpita et al. 1998). While research has found that other cognitive styles, such as locus of control, might mediate the parenting-anxiety link in youth (Chorpita et al. 1998), our study suggests that, among early adolescents, a hopeless attributional style may precipitate the development of anxiety in response to high maternal psychological control. Building on work by Chorpita et al. (1998), which explored relationships between these constructs at one assessment point, present findings suggest the relevance of a hopeless attributional style to the emergence of youth anxiety over time—especially among children with intrusive, controlling parents. Given the importance of understanding prospective risk factors for anxiety in youth, the role of attributional style in the development of youth anxiety merits more attention in future etiological research.

Our study could not confirm whether gender moderated the proposed mediational model, as tests of moderation were not significant. However, gender differences did emerge correlationally, suggesting that relations of the study's variables might differ in girls and boys. Specifically, higher perceived maternal psychological control showed associations with greater anxiety in girls, but not in boys, across measurement points. Further, a more hopeless attributional style correlated with higher perceived maternal psychological control in girls more strongly than in boys. Our lack of evidence for moderated mediation in our primary analyses despite some evidence of gender differences in our correlational analyses might be partially explained by high stability in anxiety levels over time in this study (e.g., for T1 anxiety and T3 anxiety,  $r = .75$ ,  $p < .01$ ). Gender differences in predictions of such small changes in anxiety might have been difficult to detect. Alternatively, it is possible that gender differences in anxiety evidenced in the broader literature result not from a heightened sensitivity to maternal psychological control, but from other factors, such as mothers' tendency to act more controlling towards daughters than sons (Zalta and Chambless 2011). However, this possibility is unlikely in this study, as boys and girls reported similar levels of maternal psychological control.

This study has implications for the treatment and prevention of anxiety in early adolescents. First, our findings

might suggest the importance of including parents in interventions for child anxiety. Specifically, there is a need to highlight the importance of psychological control in developing hopeless attributional styles and in turn, anxiety. Reducing parents' engagement in psychologically controlling behavior may allow youth to learn to interpret negative events in their lives in more adaptive ways and, in turn, reduce the development of anxiety. Second, because our study measures children's *perceptions* of parenting, it may be helpful for interventions to address the adolescent's perceptions of their parents' behavior in addition to their parents' actual behaviors. It is possible that some early adolescents may more readily interpret ambiguous parent behavior (e.g., firm reprimands) as critical or intended to induce guilt. Encouraging early adolescents to attend to and evaluate their perceptions of parenting may help clinicians reduce early adolescents' maladaptive attributions and anxiety symptoms. Finally, our findings highlight the importance of targeting hopeless attributions in the treatment and prevention of anxiety. For instance, youth perceiving high parental psychological control might benefit from strategies focused on using adaptive cognitive strategies to cope with conflict with parents, as well as other challenges in their lives. Targeting children's attributions may also be important when working with parents is unfeasible or unaffordable, enabling clinicians to mitigate the consequences of psychological control when they cannot alter parents' behaviors themselves.

Our study has some limitations that should be considered. First, our sample size was relatively small. We aimed to compensate for this difference by testing the proposed model using bias-corrected bootstrapping, which has been shown to operate adequately with sample sizes as small  $N = 50$ , and in some cases,  $N = 20$  (Stine 1985; Yung et al. 1996). Another possible limit was our use of child report only in assessing the impacts of parenting on anxiety. As discussed, children's perceptions of parental behaviors can greatly affect children's psychiatric outcomes and should not be ignored in etiological models or intervention designs. However, data from multiple perspectives, such as observational reports or self-report data on parents' views of their own behavior or siblings' perceptions of parental behavior, might improve findings' validity and reduce problems of shared method variance. Further, we chose to focus the paper on psychological control given its established relations with anxiety (Barber 1996; Litovsky and Dusek 1985; Nanda et al. 2012); however, other aspects of dysfunctional parenting have also been linked to anxiety via low control cognitions (McGinn et al. 2010) and should be explored in future work. Additionally, the generalizability of our study—like most studies on the etiology of youth anxiety—was limited by its largely Caucasian, middle class sample. Ethnically

and economically diverse samples are needed to understand the development of anxiety in diverse youth. Finally, while the overall mediated effect of our model was significant, baseline psychological control only marginally predicted early adolescents' attributional style. Thus, our conclusions remain tentative. Additional work on these relations will strengthen inferences regarding this pathway to the development of anxiety in early adolescents.

In sum, we have suggested a model that might partially explain the development of anxiety in early adolescents, integrating risk elicited by perceived maternal psychological control and hopeless attributional style. By using prospective, longitudinal data from youth, our study helps fill major gaps in relevant literature, which has relied largely on adult populations, cross-sectional, and retrospective analyses. We have outlined our findings' implications for the prevention and treatment of anxiety in youth, most notably regarding possible benefits to anxious youth of strategies aimed at (1) managing perceptions of parents' behaviors and (2) decreasing hopeless attributions. Finally, we have urged a more consistent, rigorous examination of gender differences in the development of anxiety across early adolescence. Our study highlights important directions for research on etiological models for anxiety in youth, and may inform optimized intervention efforts for the treatment and prevention of anxiety in early adolescents.

**Conflict of interest** The authors declare no potential conflicts of interest pertaining to this submission.

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