J Child Fam Stud (2015) 24:3279–3292
DOI 10.1007/s10826-015-0131-9

ORIGINAL PAPER

Early Forms of Controlling Parenting and the Development of Childhood Anxiety

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Published online: 22 January 2015

Abstract We examined the distinct effects of early types of externally and internally controlling parenting (coercion and overprotection) on the development of childhood anxiety, while controlling for other important risk factors. Developmental trajectories of child anxiety were modeled from a Quebec representative sample ($N = 2{,}120$ children; 2.5- to 8-years of age). The relative impact of a host of putative child, mother, and family risk factors measured in early childhood was assessed using multinomial regressions. In addition to child shyness, maternal depression and family dysfunction, both coercive and overprotective parenting increase the risk for higher child anxiety. An interaction between maternal depression and overprotection was found, indicating that overprotection only increases child anxiety when maternal depression is high. Finally, maternal overprotection was also found to predict second grade teacher reports of children's anxiety.

Keywords Controlling parenting · Child anxiety · Developmental trajectories · Coercion · Overprotection

Introduction

While anxious feelings are adaptive responses to threats and are useful for survival; their excess can impair adaptive functioning and well-being (Akiskal 1998). The difference between normal and pathology lies in the severity and frequency of symptoms (Kring and Werner 2004). Anxiety problems are among the most prevalent psychiatric disorders in both adulthood and childhood (Breton et al. 1999). Ten to 25 % of the population will be affected by an anxiety disorder during the course of their lifetime (Kessler et al. 1994), with as many as 3–24 % of children will develop one before they reach adolescence (Cartwright-Hatton et al. 2006). Anxiety problem's early onset, its high prevalence rates, along with its social and economical costs all underline the imperative need for research to further our understanding in its development and prevention.

The development of anxiety is influenced by many variables. Child risk factors include children's sex and temperament (behavioural inhibition; Grant et al. 2009). Compared to boys, girls have been found to be at risk for higher anxiety than boys, although this discrepancy generally occurs in adolescence (Bosquet and Egeland 2006). In addition, some children show an early, biologically based inhibition tendency. Behavioral inhibition is the child's early aversion to novelty, accompanied by physiological responses (e.g., high heart rate and blood pressure, pupil dilation, cold tip of fingers; Kagan et al. 2007; Snidman et al. 1995).

Among environmental influences, the familial environment has been shown to account for a sizeable part of variance in child anxiety. Lower family cohesion, expressiveness and support, as well as inter-parental conflict and stressful negative family environments are all risk factors for higher childhood anxiety (Hudson and Rapee 2009). Furthermore, poverty, adversity in marital relations and marital break-ups occurring before the age of five have been reported to increase the risk for emergence of anxiety problems during adolescence (Spence et al. 2002). Finally, maternal characteristics, notably depressive symptoms,

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have been linked with child internalizing problems in several studies (e.g., Laskey and Cartwright-Hatton 2009; Murray et al. 2009).

One's family makes its mark on one's proneness to anxiety problems as they tend to aggregate in families (Bögels and Brechman-Toussaint 2006). Children of parents with anxiety disorders are five to seven times more likely to also be diagnosed with one, as compared to children of parents without an anxiety disorder (Beidel and Turner 1997). This holds true, even though family and twin studies suggest only a moderate heritability of anxiety problems (30–40 % of the overall variance; Hettema et al. 2001), thus allowing for the majority of the variance to be influenced by the child's environment. Though maternal psychopathology is predictive of child functioning deficits above and beyond genetic influences (Hammen et al. 1990), maternal diagnosis is a secondary factor to maternal behaviours toward one's child, when addressing the aetiology of childhood anxiety (e.g., Laskey and Cartwright-Hatton 2009; Murray et al. 2009). Over the last 15 years, seven meticulous literature reviews or meta-analyses targeting the impact of childrearing practices on the development of anxiety have been conducted in the clinical literature (Ballash et al. 2006; DiBartolo and Helt 2007; McLeod et al. 2007; Murray et al. 2009; Rapee 1997; van der Bruggen et al. 2008; Wood et al. 2003). Each suggests that diverse forms of controlling parenting are the strongest and most consistent parenting predictors of childhood anxiety, while parental harshness seems to yield an inconsistent effect on child anxiety. These studied constructs include overcontrol (excessive parental regulation of children's activities and routines; McLeod et al. 2007; Murray et al. 2009), overinvolvement (parental interference with child's autonomy and emotional independence—boundary problems; McLeod et al. 2007; Murray et al. 2009) and autonomy thwarting (parental determent of children's opinions, choices, and/or input on decisions and solutions of problems; McLeod et al. 2007). McLeod et al. (2007)'s meta-analysis found that parental autonomy thwarting and parental overinvolvement explained the greatest proportion of variance in childhood anxiety (18 and 5 % respectively), among other parental variables.

Socialization research also points to the significance of controlling parenting (e.g., Barber et al. 2005) in child non-optimal development. Controlling parenting is defined as practices that put pressure, are intrusive or are domineering on children (Grolnick and Pomerantz 2009). Notably, it is important to differentiate controlling parenting from structure (Grolnick and Pomerantz 2009; Soenens and Vansteenkiste 2010). The latter refers to parents emphasizing the relationship between actions and outcomes through clear and consistent guidelines for children, while also supplying them with predictable consequences and clear feedback regarding their conduct (Farkas and Grolnick 2010; Grolnick and Pomerantz 2009). Structure's opposite is laxness in rule application (aka. permissiveness; Baumrind 1966). Controlling parenting, on the other hand, is characterized by pressure, intrusion, and power assertion (Grolnick and Pomerantz 2009). While the competence-support inherent in structure fosters healthy development, the power assertion inherent to controlling parenting is detrimental for children, especially for internalizing problems (e.g., Ballash et al. 2006). According to Soenens and Vansteenkiste (2010), there are internal and external types of controlling parenting. Internally controlling parenting targets internally pressuring feelings in children functioning. It promotes children's internalization of guilt, shame, self-worth concerns and anxiety provoking beliefs. Examples of such tactics include overprotection, guilt-induction, shaming and love-withdrawal. Each encourages children to put pressure on themselves to become or act as implied by a pressuring socialization agent. However, as overprotective parenting appeals to feelings of anxiety and may also trigger feelings of personal incompetence (Affrunti and Ginsburg 2012), it can be considered as a primary example of internally controlling parenting. Conversely, with externally controlling parenting, children abide to rules out of fear of the parent (Ryan et al. 2006). This parenting style involves the use of external contingencies that make children feel pressured from the outside (rather than from within). Examples of externally controlling parenting include threats of punishment, taking away privileges, and coercive practices (including physical punishment). While internally controlling parenting involves parents' direct appeal to feelings of anxiety (by pointing out that the child is unable to do things safely or well without parental assistance), externally controlling parenting may have more (unintended) effect of evoking anxiety.

An overlap is clearly present between the terms used in clinical and socialization literature. Parents' interference with children's age appropriate autonomous and emotional liberties, their excessive regulation of children's activities, and their discouragement of children's opinions, choices and input each reflect pressuring, intrusive and/or domineering parental practices as defined in controlling parenting (Grolnick and Pomerantz 2009). This corroborates the importance of the controlling parenting construct in non-optimal child development, especially in the development of children's anxiety problems. Yet, the examination of both types of controlling parenting has not been examined and compared explicitly in the literature. Moreover, it seems important to examine how internally and externally controlling parenting interact with other important risk factors. To date, some research has shown that parenting risk factors have stronger consequences on more vulnerable children (e.g., Feng et al. 2011; Grolnick et al.

1996) and that maternal depression interacts with parenting risk factors, exacerbating their effect (e.g., Field et al. 2006). Examining the potential moderating role of both child and parent vulnerabilities seems valuable to obtain a better overall picture of how child anxiety develops over time.

It is quite informative to examine the continuity and change of children's anxiety over time. We cannot assume that problematic behaviors are stable over time, nor that they evolve the same way for all children. By using a heterogeneous approach, (Nagin 2005), distinct trajectories can be isolated, over time. To our knowledge, only two studies have modeled child anxiety trajectories and have attempted to identify their predicting risk factors (Feng et al. 2008; Duchesne et al. 2010). Of these two, only Feng et al. (2008)'s study assessed controlling parenting as a potential risk for children to follow a higher anxiety trajectory. In this study, an observed measure of maternal "negative control" was found to put boys at higher risk for anxiety, no matter their initial anxiety level at age two, and above and beyond the impact of other significant risk factors. Though the sample was limited to boys and the negative control variable was broad (aggregating both externally and internally controlling parenting), this observational study was informative in pointing out the impact of a controlling stance on the anxiety trajectory children may follow. In Duchesne et al. (2010)'s study, a measure of maternal discipline (i.e., structure) increased the probability for middle childhood children to follow the high-stable anxiety trajectory, as opposed to the low-stable one. These results were in the opposite direction of the authors' hypothesis, namely that discipline would protect against the development of anxiety. A closer look at the discipline measure reveals that structure items (e.g., "It is important for a child to have a fixed bedtime") may have been aggregated with more controlling items (e.g., "I don't tolerate temper tantrums"). Although the study was based on a population-based sample, the absence of a controlling parenting measure and the broad definition of discipline limit the study's conclusion about the role played by controlling parenting on child anxiety trajectories.

Together, these studies suggest that some form of controlling parenting contributes to the development of childhood anxiety but further research is needed to clarify what aspects of controlling parenting are involved. The present study will build on the recent research studying child anxiety trajectories (Feng et al. 2008; Duchesne et al. 2010), combining some of their strengths. Similarly to the study conducted by Duchesne et al. (2010), we will examine data from a population-based sample to model child anxiety trajectories. Next, similarly to Feng et al. (2008), we will examine the impact of controlling parenting onto child anxiety trajectories. Finally, in addition to distinguishing controlling parenting from structure, both externally and internally controlling parenting (coercion and overprotection) will be differentiated, to examine their unique contribution. The goal of the present study was thus to compare the impact of two types of controlling parenting (external and internal) on the likelihood, for children, to follow distinct anxiety trajectories (from 2.5- to 8-years of age; mother-rated). We aimed to examine their unique and relative contribution in the context of other key parenting dimensions (i.e., warmth/involvement, structure and permissiveness) and other putative risk factors for anxiety (e.g., child's sex and behavioural inhibition, maternal depressive symptoms, familial status, family dysfunction and SES). In addition, we tested whether these same risk factors would also predict child anxiety, as rated by an additional informant (2nd-grade teachers). Finally, we wished to assess whether their impact were moderated by mother and child vulnerabilities (mothers' depressive symptoms and children's behavioral inhibition). The first hypothesis was that both types of controlling parenting would have a detrimental impact on the development of child anxiety. We expected that externally and internally controlling parenting would be related to greater risk of following higher trajectories of mother-rated anxiety and of being rated as more anxious by school teachers. Next, we expected that the negative impact of controlling parenting would be exacerbated by mother and child vulnerabilities. It was expected that the detrimental impact of controlling parenting onto anxiety trajectories would be heightened when mothers experience more depressive symptoms and when toddlers show a higher vulnerability toward anxiety (i.e., inhibition).

Method

Participants

The present study used data from the Québec Longitudinal Study of Child Development (QLSCD), conducted by Institut de la statistique du Québec (Santé Québec division; for more detailed QLSCD methodology see Jetté 2002; Jetté and Des Groseilliers 2000). It is a longitudinal study that annually follows a representative birth cohort of the province of Quebec, Canada ($N = 2{,}120$ children and their families). The target population represented approximately 96.6 % of the Quebec newborn population born between October 1997 and July 1998. Only mothers who gave single births and who lived in the province at least until the target child was 4-years-old were eligible to participate and included in the study. Infants were selected from the 1997–1998 Master Birth Register of the Ministry of Health and Social Services, which contains records of all birth

certificates by calendar year. Attrition for this study is low, as 92.8 % of the families in the 1998 pool ($N = 2{,}120$ infants) completed the full longitudinal study until 2002. Reasons for study withdrawal were varied, including moving out of the province, target child death, or inability to correspond with families. At birth, the majority of the parents were 30–34 years of age, with most living in a nuclear family (80 %), as compared to blended (10.8 %) and single parent (9.2 %) families. Forty-two percent of child participants were from only child households, while 58.3 % had at least one sibling at birth. The majority of the sample spoke only French at home (75.2 %) and the majority of parents had postsecondary education (70.7 % of mothers).

Procedure

Apart from the child's sex (collected from birth medical records) and teacher ratings of child anxiety, all other variables examined in the present study were reported by the primary caregiver (the mother in 99 % of cases). The familial status and maternal overprotection variables were collected through a paper–pencil questionnaire answered by the primary caregiver. All other variables were collected as part of a computerized questionnaire administered during a face-to-face interview in the child's home with its primary caregiver. The child's sex was collected at 5-months; maternal depressive symptoms and family dysfunction measures were collected when children were 1.5-years of age; and all other putative risk factors were measured when children were 2.5-years old.

Measures

The dependent variable of child anxiety was measured as follows. Six maternal reports of child anxiety were used, between the ages of 2.5- and 8-years-old (see Table 1). At each of these time points, the same three questions were asked: *How often would you say that (name) is nervous, is high-strung or tense?; is too fearful or anxious?; is worried?* This consistency enabled us to use these same anxiety measures over time to model anxiety trajectories. The items came from Preschool Behaviour Questionnaire (Behar and Stringfield 1974). Items on the anxiety scale ranged from 0 (*does not apply or never*) to 2 (*frequent behaviour/often*). Internal cohesion for all six maternal reports on this dimension ranges between .50 and .67. Children anxiety was also assessed by second grade teachers when children were 7-years-old, the year mother reports of their child's anxiety were not collected. Essentially the same items were provided to the teachers as to the parents: *Over the last 6 months, how often would you say that (name) is nervous, high-strung or tense?; is too fearful or anxious?; is worried? has cried a lot?* Similarly, items on this anxiety scale ranged from 0 (Does not apply or never) to 2 (Frequent behaviour/often; Cronbach $\alpha = .65$).

The following child characteristics were studied. The child's sex was included as a variable of interest in this study, as being a girl has sometimes been associated with higher anxiety. We also included the behavioural inhibition, as it is a robust temperamental risk factor for childhood anxiety. The scale comprises the following three items, ranging from 0 (Never) to 3 (Frequently): *How often would you say that (name) is shy with children he/she does not know?; readily approaches children he/she does not know?; takes a long time getting used to being with children he/she does not know?* The questions were adapted from the Parental Inhibition Scale (Asendorpf 1990) and the scale has been found to have a satisfactory reliability in previous studies (e.g., Boivin et al. 2005) and in the present study (Cronbach $\alpha = .72$).

The mother and family characteristics of maternal depressive symptoms, family dysfunction, familial status and socio-economic status (SES) were also selected as putative predictive risk factors. The measure of maternal depressive symptom was adapted from the Center for Epidemiologic Studies Depression Scale (Radloff 1977; Cronbach $\alpha = .81$). This 12-items scale measures the frequency of depressive symptoms (e.g., *How often have you felt or behaved this way during the past week: I did not feel like eating; my appetite was poor*) and their relative severity during the mothers' previous week, ranging from 0 (rarely or none of the time [less than 1 day]) to 3 (most or all of the time [5–7 days]). The family dysfunction scale was adapted from a validated instrument (Offord et al. 1987). This shortened version is composed of 7 items, targeting mutual acceptance, freedom of affect expression and of resolving problems, respect, and support (Cronbach $\alpha = .83$). Ranging from 0 (Strongly agree) to 4 (Strongly disagree), items include: *Individuals (in the family) are accepted for what they are (reversed item); There are lots of bad feelings in our family; We don't get along well together.* Higher scores indicate higher levels of relationship difficulties within the family. Familial status was reported to be either intact/nuclear, blended or a single parent dwelling. For this variable, the mother needed to indicate whether she had a spouse, whether he lived in the same house and clarify the nature of his relationship to her child *(biological father, adoptive or step-father).* This measure was used in previous studies (e.g., Côté et al. 2007; Huijbregts et al. 2008). To yield a family intactness/status score, we recoded these items to yield a dichotomous variable (either intact or not-intact families). Finally, in order to yield a SES index, a combination of the following measures was used: professional prestige, level of education and financial/economic position of the parents of the

Table 1 Descriptive statistics

Variables	Child age	*N*	*M*	*SD*	Min	Max
Anxiety symptoms (MR)						
	2.5	1,996	1.03	1.54	.00	6.00
	3.5	1,948	2.40	1.82	.00	6.00
	4.5	1,942	2.04	1.79	.00	6.00
	5	1,759	2.50	1.90	.00	6.00
	6	1,492	2.63	2.00	.00	6.00
	8	1,450	1.59	1.32	.00	6.00
Anxiety symptoms (TR)						
	7	1,259	2.31	2.34	.00	10.00
Continuous risk factors						
Shyness	2.5	1,996	2.71	2.57	.00	10.00
Family dysfunction	1.5	1,942	1.27	1.28	.00	7.14
Maternal depression	1.5	2,034	1.36	1.37	.00	9.72
SES	2.5	1,974	.00	1.00	−3.03	3.68
Coercion	2.5	1,989	2.57	1.15	.00	8.13
Overprotection	2.5	1,925	3.79	2.31	.00	10.00
Permissiveness	2.5	1,989	4.27	1.26	.50	10.00
Warmth/involvement	2.5	1,519	3.41	.89	1.00	9.00
Structure	2.5	1,989	7.38	1.11	2.80	10.00
Dichotomous risk factors						
Child sex	2.5	2,120				
Boys (1)		1,080	50.90 %			
Girls (2)		1,040	49.10 %			
Family status	2.5	2,120				
Intact (1)		1,544	72.80 %			
Non-intact (2)		576	27.20 %			

The table depicts observed minimum and maximum scores. Other than the SES and anxiety measures, every variable was standardized on a 0–10 scale

MR mother report, *TR* teacher-report

target child. This calculation method is described in Desrosiers (2000). For each parenting dimension, all items range from 1 (Never) to 5 (All the time). A four-items subscale of parental warmth/involvement (Cronbach $\alpha = .62$) assesses the extent to which mothers spend time with their child, enjoy it and express warmth (e.g., *In the past 12 months, how often did you and he/she talk or play with each other, focusing attention on each other for 5 min or more, just for fun?).* These items were initially part of a larger, general "positive parenting/interactions" scale used in previous studies (e.g., Bigras et al. 2010). In order to assess the level of structure provided by mothers, we used five items loading on a structure dimension (Cronbach $\alpha = .61$). These items tap into the degree of consistency and induction in discipline, as well as explanation about problems and alternative ways to behave (e.g., *In the past 12 months, when you gave him/her a command or order to do something, what portion of the time did you make sure that [name] did it?*). To assess parental permissiveness towards rules and disciplines, we used four items loading on a lack of structure (Cronbach $\alpha = .62$; e.g., *In the past 12 months, when [name] broke the rules or did things that he/she was not supposed to, how often did you: ignore it; do nothing?).* The coercion subscale comprises eight items (Cronbach $\alpha = .74$) and generally refers to critical, threatening and power assertive strategies and comments (e.g., *In the past 12 months, how often did you tell him/her that he/she was bad or not as good as others?; when (name) broke the rules or did things that he/she was not supposed to, how often did you use physical punishment?*). This variable represents a form of externally controlling parenting. Finally, the four-item overprotection subscale taps behaviours reflecting mothers' reluctance of separating from their child and concern for the safety and protection of their child (Cronbach $\alpha = .68$). Examples of items include: *I insist upon keeping my child close to me at all times, within my eye sight and in the same room as I am; When I leave my child with a baby-sitter, I miss him/her so much that I cannot enjoy myself.* This variable is seen as a form of internally controlling parenting.

Key parenting dimensions were assessed by using mothers' reports of their beliefs and behavioural tendencies toward their child. The list of items can be found in Table 2. For this study, we extracted measures of key parenting

Table 2 List of items in each parenting dimension

Maternal warmth/involvement
1. How often do you talk or play with him or her?
2. How often are you doing a special activity together?
3. How often are you doing sports/hobbies together?
4. What is the percentage of time for which you praise a behavior?
Maternal structure
1. When you order him to do something, what is the percent of time that you make sure that s/he executes it?
2. How often do you tell him/her that s/he will be punished if s/he does not stop or continues a behaviour?
3. How often do you remove privileges or do you send your child to his/her room?
4. How often do you discuss the problem calmly with your child?
5. What is the proportion of time in which you explain to him/her other ways to behave?
Maternal permissiveness
1. How often do you let pass something you've should have to punish him/her for?
2. How often has your child managed to avoid punishment?
3. When you punish your child, you did not firmly implement it?
4. How often did you do not take into account what s/he was doing?
Maternal coercion
1. How often do you tell your child that he/she is not nice/not good?
2. What percentage of your time do you talk to him/her about his/her disapproving conduct?
3. How often are you angry when you punish your child?
4. How often does implementation of punishments depend on your mood?
5. How often are your personal challenges make you take it out on him/her?
6. How often are punishments repeatedly given to the same problems?
7. How often do you raise your voice, scold or yell at your child?
8. How often do you give or inflict corporal punishment?
Maternal overprotection
1. I assure that my child remains near me.
2. I consider myself a "real mother hen"
3. When my child is being babysat, I miss him/her so much that I waste my outing
4. I can not make up my mind as to whether I should get him/her babysat

dimensions on the basis of a factor analysis and theory (Deci and Ryan 2008; Grolnick and Pomerantz 2009; Soenens and Vansteenkiste 2010), allowing us to distinguish between parenting dimensions. Using orthogonal varimax rotation, two factor analyses were conducted; one for the "positive" practices and another for the "negative", controlling practices (17- and 12-items, respectively). Both sample size and correlations were sufficient to run the factor analyses (Positive practices: Kaiser–Meyer–Olkin = .695; Bartlett's test of sphericity $\chi^2[78] = 4{,}220.30$, $p < .00$; Controlling practices: KMO = .773; Bartlett's test of sphericity $\chi^2[66] = 4{,}301.81$, $p < .00$). Although we expected two factors among the positive parenting practices (i.e., warmth and structure), three factors were found with eigenvalues over Kaiser's criterion of 1. Together, the warmth, structure and permissiveness explained 47.15 % of the variance. As expected, the factor analysis for controlling practices yielded two factors, distinguishing coercion from overprotection (eigenvalues >1; combined explained variance = 41.90 % of the variance).

Data Analyses

First, we modeled developmental trajectories of children's anxiety from 2.5- to 8-years-old, using the Proc TRAJ procedure with SAS (Nagin 2005). Trajectory analyses enable the description of how groups of children display distinct levels of anxiety over time. First, the developmental trajectories of anxiety were assessed using a semi-parametric mixture model (for details see Nagin 2005). Next, the 11 potential risk factors were assessed independently, using logistic regression analyses to assess their relative predictive value in distinguishing anxiety trajectories from one another. Third, the variables identified as

significant risk factors were entered together as independent variables in multinomial regression analyses in order to examine their relative contribution in distinguishing anxiety trajectories. Fourth, we examined whether the effect of identified parenting risk factors would be moderated by children's temperament (inhibition) and/or mothers' depressive symptom level. Fifth, we aimed to examine how these child, maternal, and familial measures would predict children's anxiety, as reported by children's 2nd-grade teachers. The relative association value of the 11 putative risk factors was examined in relation to teachers' reports of children's anxiety, at 7 years of age, using correlation analyses. Finally, a linear regression was conducted to assess the relative predictive contribution of the variables found to relate with teacher-rated child anxiety.

Some preliminary analyses were conducted. For each variable other than SES and the anxiety scores used in the trajectories, averages were calculated and scores were then standardized, rendering variables ranging from 0 to 10. The anxiety scores used in the trajectories were standardized on a 0 to 6 scale (Table 1). Participants had missing values when more than two-thirds of the items for a variable were missing. The SES scale was carefully calculated into an index following the procedure described in Desrosiers (2000). Both maternal warmth/involvement and depressive symptoms did not follow a normal kurtosis distribution (above $\pm$ 3.00; Kline 1998). The mothers' warmth and depression scores had little variance and were too closely distributed around the mean to attain a normal kurtosis distribution. This should be kept in mind when interpreting analyses including these variables, as relationships may be over- and underestimated, respectively. As for the anxiety variables used to yield the trajectories, the Proc TRAJ procedure treats the missing data with full information maximum likelihood (FIML). In these cases, a participant is kept even if it has only one assessment. Descriptive statistics for all variables included in the study are shown in Tables 1 and 3 presents the zero-order correlations among independent variables and teacher-rated anxiety. With the aid of a semiparametric mixture model, we distinguished groups of children displaying distinct anxiety patterns over time. This method detects population heterogeneity across time as its parameters are at liberty to differ between groups (Nagin 2005). Following the Bayesian Information Criterion (BIC criteria; Nagin 2005), models with two- to four- anxiety groups were estimated. Semiparametric mixture model estimation yields output identifying each trajectory (patterns of stability and variations), the respective estimated proportion of the population belonging to each of them, as well as, at the individual level, the estimated posterior probability of participants belonging to each trajectory group. In other words, the model coefficients indicate, for each child, the estimated probability that s/he would follow each trajectory. The models with three- and four- anxiety groups had relatively close BICs ($-15{,}149.43$ and $-15{,}123.58$, respectively). We selected the three-group model for parsimony.

Results

As seen in Fig. 1, anxiety levels are generally not very elevated, representing the general population rather than a clinical population. The first trajectory is very low and stable, with children demonstrating very little or no anxiety symptoms overall. An estimated proportion of 22.5 % of the children follow this *lowest anxiety trajectory*. The second and most common trajectory starts with low levels of anxiety at 2.5 years of age and exhibits a gradual increase in anxiety, reaching a moderate level of anxiety at 8-years-old. Approximately 51.8 % of the children exhibit this *low-rising trajectory*. The third and highest trajectory begins with a higher anxiety level among toddlers. There is a gradual increase until 6 years of age, followed by a steadier path onward. The estimated proportion of the sample following this *highest trajectory* is 25.9 %.

In order to identify which factors significantly distinguished anxiety trajectories from one another, a series of logistic regressions were performed. Given the potential uncertainty in "assigning" a child to a trajectory, all regressions were weighted by posterior probabilities. Table 3 summarizes the singular effect of each independent factor in distinguishing anxiety trajectories from one another resulting from these regressions. As can be seen in Table 3, children's inhibition, family status, dysfunction and SES, as well as maternal depressive symptoms, coercion, overprotection and permissiveness each distinguished anxiety trajectories from one another. On the other hand, neither the child's sex, nor the parenting dimensions of maternal warmth/involvement and structure contributed in predicting childhood anxiety trajectories. The latter three variables were thus dropped from further analyses.

The goal was to examine the relative and joint contribution of the eight early child, maternal, familial, and parenting variables that were identified as significant risk factors. Multinomial regression was performed with the following predictors, entered together in the model ($N = 1{,}812$): Children inhibition, family status, family dysfunction, SES, maternal depressive symptoms, as well as maternal coercion, overprotection, and permissiveness.

Results of the multinomial regression reveal that five of the eight independent variables remained significant risk factors. The risk factor contributing the most in distinguishing trajectories from one another was children's inhibition ($\chi^2[2] = 37.77$, $p < .05$). Regarding maternal depressive symptoms, it also remained a significant and

Table 3 Relationship among predictors and with anxiety outcome measures

	1	2	3	4	5	6	7	8	9	10	11
Bivariate correlations among predictors and teacher-rated child anxiety											
1. Sex											
2. Inhibition	.03										
3. Family status	−.02	.00									
4. Family dysfunction	.01	.05*	.19*								
5. Depression	−.04	.05*	.15*	.38*							
6. SES	.02	.00	−.27*	−.15*	−.22*						
7. Coercion	−.12*	.03	.01	.15*	.19*	−.14*					
8. Overprotection	−.01	.06*	.07*	.10*	.16*	−.33*	.09*				
9. Permissiveness	−.04	.02	.10*	.13*	.12*	−.14*	.36*	.19*			
10. Warmth/involvement	−.04	.00	−.05*	−.06*	−.02	.11*	−.06*	.05*	.02		
11. Structure	−.04	−.06	−.03	−.17*	−.13*	.20*	−.05*	−.21*	−.30*	−.05	
12. Anxiety—7 yo (teacher reports)	−.04	.06*	.11*	.04	.03	−.13*	.02	.11*	.02	−.01	−.03
Individually modeled factors assessing predictability of anxiety trajectories (mother reports)											
χ^2 joint test of significance ($df = 2$)	.15	48.12*	7.23*	37.02*	51.38*	9.82*	42.44*	19.83*	12.25*	.44	.27

All variables are in continuous forms

* $p < .05$ (two tailed tests)

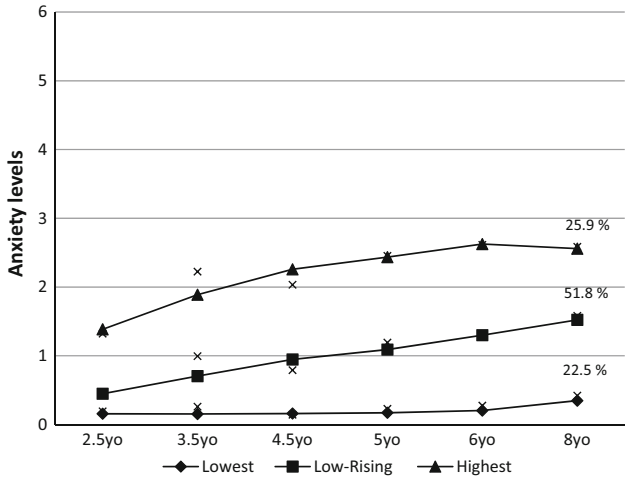

Fig. 1 Trajectories of childhood anxiety from 2.5- to 8-years of age. Percentages indicate the estimated proportion of the population that follow each trajectory

strong risk factor ($\chi^2[2] = 14.00$, $p < .05$). Next, among the familial factors, only family dysfunction significantly discriminated across anxiety trajectories ($\chi^2[2] = 8.40$, $p < .05$). In terms of parenting dimensions, the two forms of controlling parenting remained significant risk factors. Maternal coercion had the highest discriminating power across anxiety trajectories ($\chi^2[2] = 20.01$, $p < .05$), followed by maternal overprotection ($\chi^2[2] = 9.72$, $p < .05$). Maternal permissiveness did not remain a significant risk factor ($p = .97$). Neither the familial status nor the SES level significantly discriminated between anxiety trajectories ($p = .59$, $p = .86$; respectively). In sum, when the predictive value of all the key risk factors was tested within the same model, thus controlling for their shared variance, five of the previously identified risk factors contributed in distinguishing anxiety trajectories from one another (i.e., children's inhibited temperament, mothers' depressive state, families' dysfunction, as well as coercive and overprotective parenting).

As a second step, moderation effects were assessed in order to examine whether the impact of the controlling parenting styles (coercion and overprotection) onto childhood anxiety trajectories would be moderated by children's and/or mother's affective vulnerabilities (i.e., children inhibition; maternal depressive symptoms). When the four interaction terms were included as independent factors in the model, along with the eight initial variables, only the interaction between maternal depressive symptoms and overprotection emerged as a significant predictor, distinguishing anxiety trajectories ($\chi^2[2] = 6.49$, $p < .05$). The variables of maternal depressive symptoms and overprotection were no longer significant risk factors, as their effects were subsumed under this interaction ($p = .43$; $p = .32$, respectively). The main effects of children's inhibition, family dysfunction and maternal coercion prevailed, indicating that these factors still significantly differentiate anxiety trajectories from one another ($\chi^2[2] = 15.04$, $p < .05$; $\chi^2[2] = 8.35$, $p < .05$; $\chi^2[2] = 18.45$, $p < .05$, respectively). No other interaction effect approached

significance (all $ps > .05$) and family intactness, SES and maternal permissiveness remained non-significant factors ($p = .65$; $p = .87$; $p = 97$, respectively).

In order to clarify which anxiety trajectory was predicted by each of these significant factors, contrasts were explored. Table 4 presents the factors that significantly distinguish between a pair of trajectories (e.g., *highest* vs. *lowest*). The reported odd ratios can be translated into effect sizes as follows: for each increase of one unit of a continuous variable, there is an increase in probability ([odd ratio − 1] × 100) for children to follow a higher anxiety trajectory as compared to a lower one. For example, for the inhibition variable, an odd ratio of 1.32 found in the contrast between the highest and lowest trajectory implies that for each increase of one point on the inhibition scale (ranging from 0 to 10), it increases the probability by 32 % for a child to follow the *highest* trajectory as compared to the *lowest* one.

Results indicate that inhibition discerned between children following the *highest* trajectory from those following the *lowest* and from those following the *low-rising* trajectory course ($\chi^2[1] = 12.45$, $p < .05$; $\chi^2[1] = 10.53$, $p < .05$, respectively). Similarly, maternal coercion differentiated between children trailing on the *highest* anxiety trajectory from those following the *lowest* and from those following the *low-rising* trajectory ($\chi^2[1] = 17.72$, $p < .05$; $\chi^2[1] = 10.10$, $p < .05$, respectively). Family dysfunction discriminated children following the *lowest* trajectory from those following the *low-rising* or the *highest* trajectory ($\chi^2[1] = 4.84$, $p < .05$; $\chi^2[1] = 8.21$, $p < .05$, respectively).

The interaction term of maternal depressive symptoms by overprotection discriminated between children following the *highest* trajectory from those following the *lowest* anxiety trajectories ($\chi^2[1] = 6.49$, $p < .05$). As can be seen in Fig. 2, this interaction effect suggests that maternal overprotection predicts children following the *highest* anxiety trajectory versus the *lowest* one only when maternal depressive symptoms are high. The odd ratio and effect size for this interaction term can also be seen in Table 4.

Teacher-rated anxiety was also assessed. In a first step, a series of One-way ANOVAs was conducted to examine whether the subsample of children for whom teacher ratings of child anxiety were available ($n = 1{,}259$) differed significantly from the larger, representative sample, on the eleven putative risk factors. Results reveal that the subsample differed significantly from the larger one on five variables: there was a larger proportion of girls (64 %, $F[1, 2{,}118] = 16.95$, $p < .05$) and of intact families (63 %, $F[1, 2{,}118] = 30.37$, $p < .05$) within the subsample, and the SES was higher ($M_{missing} = -.13$ vs. $M = .08$, $F[1, 1{,}972] = 19.51$, $p < .05$). Parenting was also characterized as more

Table 4 Predictors significantly distinguishing between anxiety trajectories and respective effect sizes

Low-rising versus lowest				Highest versus lowest				Highest versus low-rising			
	OR	ES (% increase)	95 % CI		*OR*	ES (% increase)	95 % CI		*OR*	ES (% increase)	95 % CI
		–		Inhibition	1.32*	32 %	1.13 –1.53	Inhibition	1.22*	22 %	1.08 –1.37
Family dysfunction	1.13*	13 %	1.01–1.27	Family dysfunction	1.20*	20 %	1.06–1.36			–	
		–		Coercion	1.58*	58 %	1.28–1.96	Coercion	1.33*	33 %	1.12–1.59
		–		Depression × overprotection	1.07*	7 %	1.02–1.12			–	

N = 1,812. All of the eight significant putative predictors were included in these multinomial regression analyses (i.e., child shyness; family SES, intactness and dysfunction; maternal depressive symptoms, coercion, overprotection, and permissiveness)

OR odds ratio, *ES* effect size, *CI* confidence interval

* $p < .05$ (two tailed tests)

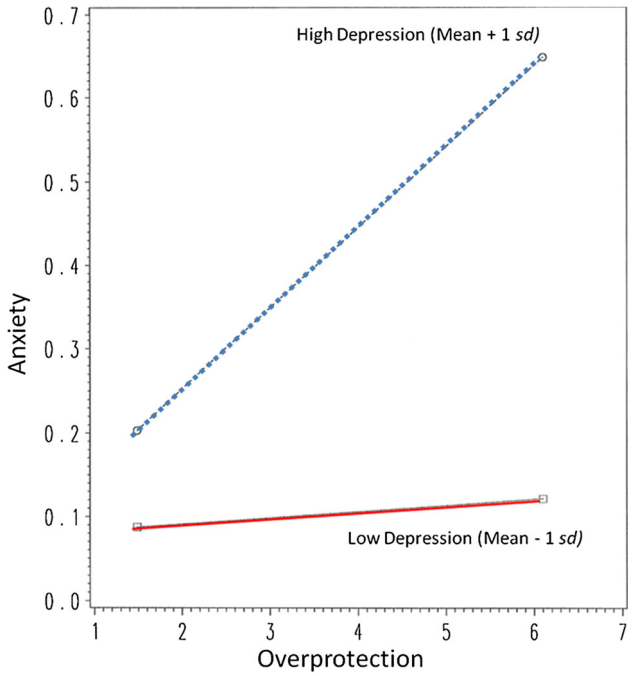

Fig. 2 Interaction between maternal overprotection and depression when predicting children's likelihood of following the highest (vs. the lowest) anxiety trajectory

structuring ($M_{missing} = 3.55$ vs. $M = 3.64$, $F[1, 1{,}991] = 6.76$, $p < .05$) and less overprotective ($M_{missing} = 3.98$ vs. $M = 3.69$, $F[1, 1{,}923] = 7.11$, $p < .05$).

After examining correlations between the eleven risk factors with teacher-rated anxiety (see Table 3), a linear regression was used to assess which child, family and parenting characteristics would predict child anxiety scores as reported by this independent informant, at 7 years of age. Correlational analyses revealed that children's inhibition, family's intactness and SES, as well as overprotective parenting were significantly correlated with child anxiety as reported by second grade teachers. Next, these four variables were included in a linear regression and results suggest that these four early child, family and parenting characteristics all predicted later child anxiety scores as reported by their 2nd-grade school teachers ($R = .18$, $R^2 = .03$, $F[4, 1{,}205] = 10.04$, $p < .05$. The children's inhibition (*Stand.* $\beta = .06$, $p < .05$), the family's intactness/status (*Stand.* $\beta = .08$, $p < .05$) and SES (*Stand.* $\beta = -.09$, $p < .05$), and maternal overprotection (*Stand.* $\beta = .07$, $p < .05$) were all significant predictors of teacher-rated anxiety. Thus, at 2.5-years of age, an inhibited temperament, a non-intact family, a lower SES and higher levels of maternal overprotection all predicted teachers' notice of higher anxiety symptoms, 5 years later. Moreover, as a second step, two interaction effects were added to the model to examine whether overprotective parenting would be moderated by children's and/or mother's affective vulnerabilities (i.e., children inhibition; maternal depressive symptoms). Neither of the interaction terms were significant predictors of teacher-rated anxiety (maternal depressive symptoms and child inhibition *ps* = .32 and .15, respectively). This indicates that when predicting teacher-rated child anxiety, maternal overprotection is not moderated by child and maternal attributes.

Discussion

In the present study, the main goal was to examine the impact of two types of controlling parenting on children's anxiety trajectories. The respective associations of internally (i.e., overprotection) and externally (coercive) controlling parenting with anxiety were explored, taking principal anxiety risk factors into account. Overprotection, a form of internally controlling parenting, may convey to children that they will lack in safety and competence without parental assistance, appealing to feelings of anxiety through internalization of self-worth concerns and anxiety provoking beliefs. Conversely, coercion, a form of externally controlling parenting evokes anxiety more unintentionally as the primary goal is to instill fear in children to gain or maintain better control over them.

As expected results showed that while both coercion and overprotection play important roles in anxiety development, they seem to do so differently. One indication of these different and respective links to childhood anxiety was found when interaction effects were investigated. Unsurprisingly, maternal coercion, a variable said to elicit fear of the other (Ryan et al. 2006), differentiated the highest from both lower anxiety trajectories in our study. It thus seems that eliciting fear in children simply increases anxiety. On the other hand, maternal overprotection, a variable said to elicit self-doubt (Affrunti and Ginsburg 2012) was also linked to the highest anxiety level but only when mothers felt relatively more depressed or when anxiety was rated by the teacher.

The two types of controlling parenting may affect children through distinct mechanisms. It is believed that coercion promotes the development of anxiety by eliciting fear of authority figures (Ryan et al. 2006). To our knowledge, no other studies have attempted to explain the mechanism (mediation processes) by which coercion may influence the development of anxiety. Future studies should explore this avenue. In contrast, a depressed and overprotective parent may diminish children's confidence in their own capacities (dependency, self-doubt) and in the outside world (Dadds et al. 1996). Affrunti and Ginsburg (2012) found that perceived competence partially mediated the link between maternal overprotection and child anxiety. Further studies are needed to explore the distinct

mechanisms underlying the links between various types of controlling parenting and childhood anxiety. Other researchers have also found interesting interactions effects involving parental control. For instance, Aunola and Nurmi (2005) found that both high controlling parenting (e.g., love withdrawal, guilt induction) and high involvement were associated with a higher likelihood that a child will develop internalizing problems. However, in the absence of controlling parenting, there was no detrimental impact of parental involvement on child anxiety. Similarly, Grolnick (2003) reported that children of parents exhibiting both low levels of autonomy support and a high level of involvement had higher levels of symptoms. In other words, being close to a controlling parent can have harmful effects.

In our study, the other parenting practices were not predictors of child anxiety trajectories. Permissive parenting was less closely related to early child anxiety than expected. Although it was independently related with higher anxiety, it did not remain significant when examined along other predictors. Similarly, though a lack of warmth/involvement and structure have sometimes been associated with child anxiety (e.g., Baumrind et al. 2010), the present study suggests that, compared to controlling parenting, these two aspects are not as central to the development of anxiety.

Among a host of child, mother and family covariates that had the potential to distinguish among anxiety trajectories, child inhibition, familial status, SES, family dysfunction, and maternal depressive symptoms all discerned between differential pursuits of anxiety trajectories when their impact was examined individually. When joint effects were examined, temperamental inhibition was found to be a strong risk factor. Precisely, this temperamental predisposition was specifically related to the highest level of childhood anxiety (as opposed to either lower trajectory). Among the familial and maternal risk factors, only familial dysfunction and maternal depressive symptoms were identified as significant risk factors when joint effects were examined. It seems that socio-demographic variables (i.e., SES, intact or non-intact family) are not as central to childhood anxiety trajectories than the perhaps more experiential factors of family discord and maternal depressive symptoms. Higher family dysfunction was specifically related to the mere presence (vs. absence) of child anxiety, as it increases the odds of following either rising trajectories instead of the lowest one.

Together, these findings are consistent with other studies examining child, maternal and familial risk factors for childhood anxiety. For instance, toddler behavioural inhibition has been found to predict early childhood, pre-adolescent, as well as adolescent anxiety (Bosquet and Egeland 2006; Kagan et al. 2007; Pahl et al. 2012). Also, less family cohesion has been related to for later child anxiety (Varela et al. 2009), just as maternal depression has been shown to have a detrimental effect on internalizing problems (Mars et al. 2012) and more specifically on childhood anxiety (Barker et al. 2011). To supplement the main analyses, a regression predicting teacher-rated anxiety was conducted. Consistently with the main analyses, child inhibition and maternal overprotection were found to be risk factors. Surprisingly, coercive parenting and the interaction terms were not related to teacher-rated anxiety. One reason that may help understand these differing results is that the subsample of children for whom teacher reports were available differed from the larger, Quebec representative one.

The present study is not the first one to examine the effects of controlling parenting onto child *internalizing problems* trajectories (e.g., Côté et al. 2009; Letcher et al. 2009). However, to our knowledge, this is the first study to compare the effects of different types of controlling parenting (overprotection and coercion) onto the specific problem of *anxiety* trajectories within a population-based sample, as well as to assess the moderating role of maternal and child characteristics on the controlling parenting effect. Moreover, as part of a large-scale longitudinal project, the present study made use of a rich array of measures collected from a representative provincial sample. This study's main advantage allowed us to examine a host of key risk factors simultaneously. While controlling for shared variance among the different factors, analyses could assess the relative impact of each of them.

However, the measures used were not without limits, as there is relatively little information gathered within each domain and the variables' alphas were sometimes low. For example, the anxiety measure was based on only three items collected at each time point, limiting the scope and validity of these assessments. Similarly, the parenting items were extracted from more general, already existing scales, to yield precise yet sometimes narrow constructs. For instance, out of the four items of the overprotection measure, two relate to the difficulty of letting the child be babysat. Although this measure can be seen as a mild form of dependency-oriented controlling parenting (Soenens et al. 2010), it is interesting that it still relates to higher child anxiety. Another critical limitation of our study regards the directionality of effects, as non-experimental studies cannot rule out child to parent effects. For example, it is very likely that there are bidirectional effects with regards to the construct of parental overprotection. While parental worry may facilitate inhibition (Pardini 2008), it is also possible that child inhibition discourages parents to leave their anxious children with babysitters. Also, all regression coefficients predicting teacher-rated anxiety were very small. With large sample sizes, it is possible to detect small effects that otherwise would not be found in

smaller samples. Because of their small effect sizes, these results should be taken cautiously. The most important limitation of the present study is that both risk factors and child anxiety trajectories were based on measures gathered from the same informant, the mother. The shared variance between these measures may have overestimated the predictive value of studied risk factors. A different picture of the mother's and the child's behaviour may have been obtained by relying on observational measures or other informants (e.g., annual teachers' ratings of child anxiety). A teacher's assessment of the child's anxiety was included, but only at 7 years of age. Having dual informants across the years would have been helpful in assessing children's anxiety over time. Similarly, father effects were not examined in this study. It would have been interesting to assess how both caretakers' effects interact together and influence the development of child anxiety.

In our study, two types of controlling parenting (i.e., coercive and overprotective practices) were identified as important risk factors. As such, it would be advisable to prevent these parental practices in order to minimize childhood anxiety. Research conducted within the self-determination theory (SDT; Deci and Ryan 2008) framework places paramount value on autonomy, one of the essential psychological needs (Deci and Ryan 2008). In addition to demonstrating that controlling parenting hinders development by thwarting this basic need, SDT research also studies how autonomy support fosters optimal development. Above warning against controlling parenting, parenting researchers and professionals may also promote parenting that can prevent or reduce children's anxiety. Parenting in an autonomy-supportive manner fosters children's development and learning that is void of internal pressure or fear of the parent. Rather, it fosters children's development and learning by encouraging children's own volition (Joussemet et al. 2008). The encouragement and support of autonomy is known to be one of the three key components of optimal parenting, along with warmth and structure (Steinberg 1990). Koestner et al. (1984) have defined autonomy support as (1) providing rationales for requests, (2) offering choices and encouraging initiatives, (3) recognizing the feelings and perspective of the child, and (4) minimizing controlling techniques. This interpersonal style essentially respects the child's individuality. It must be differentiated from permissiveness (i.e., lack of structure) and independence promotion (i.e., encouraging the child not to rely on others for aid or support), which have negative child consequences (see Baumrind 1966; Soenens et al. 2007).

Better understanding the risk factors of childhood anxiety as well as the underlying mechanisms by which they operate is crucial. Controlling parenting seems to be a principal determinant of childhood anxiety, a common mental health problem. Since this determinant is malleable, empirical and applied efforts should be made to help parents support their children's need for autonomy and avoid thwarting it. Clinical interventions could also incorporate knowledge from the parenting research, since depressive symptoms interacts significantly with overprotection. With such further work, we can hope to better address and prevent children's anxiety, and in turn foster more optimal life trajectories.

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